References

Sources for Safety Information and Materials

Pedestrian and bicyclist safety materials can be obtained from the following sources:

Division of Bicycle and Pedestrian Transportation

North Carolina Department of Transportation
Post Office Box 25201
Raleigh, NC 27611
PHONE: 919/733-2804
FAX: 919/715-4422
EMAIL: bikeped_transportation@dot.state.nc.us

Your local AAA office

AAA Foundation for Traffic Safety

Post Office Box 8257
Fredericksburg, VA 22404
PHONE: 1-800/305-SAFE
FAX: 540/372-4405
INTERNET: www.aafts.org

Governor's Highway Safety Program

215 East Lane Street
Raleigh, NC 27601
PHONE: 919/733-3083
FAX: 919/733-0604

Institute of Transportation Engineers

525 School Street, SW
Washington, DC 20024

National Highway Traffic Safety Administration

400 Seventh Avenue, SW, Room 3416
Washington, DC 20590

Northwestern University Traffic Institute Materials

The following materials may be ordered from Northwestern University Traffic Institute:

Book Department
The Traffic Institute
Northwestern University
P. O. Box 1409
Evanston, IL 60204

Adult Guards for School Crossings (PN402) $5.00

Pedestrian Offenses (PN510) $6.00

Signals and Gestures for Directing Traffic (PN 803) $5.00

Copies may be seen at the North Carolina Department of Transportation, Division of Bicycle and Pedestrian Transportation in Raleigh (919/733-2804).

North Carolina Laws and Statutes

School Zone Laws of North Carolina

All statutes cited are from the Motor Vehicle Laws of North Carolina, which are part of the North Carolina General Statutes.

20-114.1. <u>Willful failure to obey law-enforcement or traffic-control officer; firemen as traffic-control officers; appointment, etc., of traffic control officers.</u>

(a) No person shall willfully fail or refuse to comply with any lawful order or direction of any law-enforcement officer or traffic-control officer invested by law with authority to direct, control or regulate traffic, which order or direction related to the control of traffic.

(b) In addition to other law enforcement or traffic control officers, uniformed regular and volunteer firemen and uniformed regular and volunteer members of a rescue squad may direct traffic and enforce traffic laws and ordinances a the scene of or in connection with fires, accidents, or other hazards in connection with their duties as firemen or rescue squad members. Except as herein provided, firemen and members of rescue squads shall not be considered law enforcement or traffic control officers.

(b1) Any member of a rural volunteer fire department or volunteer rescue squad who receives no compensation for services shall not be liable in civil damages for any acts or omissions relating to the direction of traffic or enforcement of traffic laws or ordinances at the scene of or in connection with a fire, accident, or other hazard unless such acts or omissions amount to gross negligence, wanton conduct, or intentional wrongdoing.

(c) The chief of police or county police department or the sheriff of any country is authorized to appoint traffic-control officers, who shall have attained the age of 18 years and who are hereby authorized to direct, control, or regulate traffic within their respective jurisdictions at times and places specifically designated in writing by the police chief or the sheriff. A traffic-control officer, when exercising this authority, must be attired in a distinguishing uniform or jacket indicating that he is a traffic-control officer and must possess a valid authorization card issued by the police chief or sheriff who appointed him. Unless an earlier expiration date is specified, an authorization card shall expire two years from the date of its issuance. In order to be appointed as a traffic-control officer, a person shall have received at least three hours of training in directing, controlling, or regulating traffic under the supervision of a law-enforcement officer. A traffic-control officer shall be subject to the rules and regulations of the respective local or county police department or sheriff's office as well as the lawful command of any other law-enforcement officer. The appointing police chief or sheriff shall have the right to revoke the appointment of any traffic-control officer at any time with or without cause. The appointing police chief or sheriff shall not be held liable for any act or omission of a traffic-control officer. A traffic-control officer shall not be deemed to be an agent or employee of the respective local or county police department or of the sheriff's office, nor shall he be considered a law-

enforcement officer except as provided herein. A traffic-control officer shall not have nor shall he exercise the power of arrest.

(d) No police chief or sheriff who is authorized to appoint traffic-control officers under subsection (c) of this section shall appoint any person to direct, control, or regulate traffic unless there is indemnity against liability of the traffic-control officer for wrongful death, bodily injury, or property damage that is proximately caused by the negligence of the traffic-control officer while acting within the scope of his duties as a traffic-control officer. Such indemnity shall provide a minimum of twenty-five thousand dollars ($25,000) for the death of or bodily injury to one person in any one accident, fifty thousand dollars ($50,000) for the death or bodily injury to two or more persons in any one accident, and ten thousand dollars ($10,000) for injury to or destruction of property of others in any one accident.

20-141. Speed Restrictions

Speed Limits in School Zones-----(20-141.1)

The Board of Transportation or local authorities within their respective jurisdictions may, by ordinance, set speed limits lower than those designated in G.S. 20-141 for areas adjacent to or near a public, private or parochial school. Limits set pursuant to this section shall become effective when signs are erected giving notice of the school zone, the authorized speed limit, and the days and hours of when the lower limit is effective, or by erecting signs giving notice of the school zone, the authorized speed limit and which indicate the days and hours the lower limit is effective by an electronic flasher operated with a time clock. Limits set pursuant to this section may be enforced only on the days when school is in session, and no speed limit below 20 miles per hour may be set under the authority of this section.

20-217. Motor Vehicles to Stop for Properly marked and Designated School Buses in Certain Instances; Evidence of Identity of Driver

(a) The driver of any vehicle upon approaching from any direction on the same street or highway any school bus (including privately owned buses transporting children and school buses transporting senior citizens under G.S. 115C-243), while the bus is displaying its mechanical stop signal or flashing red stoplights, and is stopped for the purpose of receiving or discharging passengers, shall bring his vehicle to a full stop before passing or attempting to pass the bus, and shall remained stopped until the mechanical stop signal has been turned withdrawn, the flashing red stoplights have been turned off, and the bus has moved on.

(b) The provisions of this section are applicable only in the event the school bus bears upon the front and rear a plainly visible sign containing the words "school bus" in letters not less than eight inches in height.

(c) Notwithstanding the provisions of subsection (a) of this section, the driver of a vehicle traveling in the opposite direction from the school bus, upon any road, highway, or city street which has been divided into two roadways by an intervening space (including a center lane for left turns if the roadway consists of at least four or more lanes) or by a physical barrier, need not stop upon

meeting and passing any school bus which has stopped in the roadway across such dividing space or physical barrier.

(d) It shall be unlawful for any school bus driver to stop and receive or discharge passengers or for any principal or superintendent of any school, routing a school bus, to authorize the driver of any school bus to stop and receive or discharge passengers upon any roadway described by subsection (c) of this section where passengers would be required to cross the roadway to reach their destination or to board the bus; provided, that passengers may be discharged or received at points where pedestrians and vehicular traffic are controlled by adequate stop-and-go traffic signals.

(e) Any person violating the provisions of this section shall be guilty of a Class 2 misdemeanor.

20-218. Standard Qualifications for School Bus Drivers; Speed Limit for School Buses and School Activity Buses

(a) Qualifications. – No person shall drive a school bus over the highways or public vehicular areas of North Carolina while it is occupied by children unless the person furnishes to the superintendent of the schools of the county in which the bus shall be operated a certificate from any representative duly designated by the Commissioner and from the Director of Transportation or a designee of the Director in charge of school buses in the county showing that the person has been examined by them and is fit and competent to drive a school bus over the highways and public vehicular areas of the State. The driver of a school bus must be at least 18 years of age and hold a Class A, B, or C commercial drivers license and a school bus driver's certificate. The driver of a school activity bus must meet the same qualifications of a school bus driver or must have a license appropriate for the class of vehicle being driven.

(b) Speed Limits. – It is unlawful to drive a school bus loaded with children over the highways or public vehicular areas of the State at a greater rate of speed than 45 miles per hour. It is unlawful to drive a school activity bus loaded with children over the highways or public vehicular areas of North Carolina at a greater rate of speed than 55 miles per hour.

(c) Punishment. – A person who violates this section commits a Class 3 misdemeanor.

20-179. Sentencing Hearing After Conviction for Impaired Driving; Determination of Grossly Aggravating and Aggravating and Mitigating Factors; Punishments.

(d) **Aggravating Factors to be Weighed. –** The judge must determine before sentencing under subsection (f) whether any of the aggravating factors listed below apply to the defendant. The judge must weigh the seriousness of each aggravating factor in the light of the particular circumstances of the case. The factors are:

(1) Gross impairment of the defendant's faculties while driving or an alcohol concentration of 0.16 or more within a relevant time after driving.

(2) Especially reckless or dangerous driving.
(3) Negligent driving that lead to a reportable accident.
(4) Driving by the defendant while his driver's license was revoked.
(5) Two or more prior convictions or a motor vehicle offense not involving impaired driving for which at least three points are assigned under G.S. 20-16 or for which the convicted person's license is subject to revocation, if the convictions occurred within five years of the date of the offense for which the defendant is being sentenced, or one or more prior convictions of an offense involving impaired driving that occurred more than seven years before the date of the offense for which the defendant is being sentenced.
(6) Conviction under the G.S. 20-141(j) of speeding by the defendant while fleeing or attempting to elude apprehension.
(7) Conviction under G.S. 20-141 of speeding by the defendant by at least 30 miles per hour over the legal limit.
(8) Passing a stopped school bus in violation of G.S. 20-217.
(9) Any other factor that aggravates the seriousness of the offense.

20-16. Authority of Division to Suspend License.

(c) The Division shall maintain a record of convictions of every person licensed or required to be licensed under the provisions or this Article as an operator and shall enter therein records of all convictions of such persons for any violation of the motor vehicle laws of this State and shall assign to the record of such person, as of the date of the commission of the offense, a number of points for every such conviction in accordance with the following schedule of convictions and points, except that points shall not be assessed for convictions resulting in suspension or revocations under other provisions of laws: Further, any points heretofore charged for violation of the motor vehicle inspection laws shall not be considered by the Division of Motor Vehicles as a basis for suspension or revocation of driver's license:

Schedule of Point Values
Passing stopped school bus…….5
Driving through safety zone……..3
Speeding in a school zone…….3

20-4.01. Definitions.

(27) Passenger Vehicles

b. For hire passenger vehicles.—Vehicles transporting persons for compensation. This classification shall not include vehicles … vehicles transporting students for the public school system under contract with the State Board of Education ….

d4. School bus.—A vehicle whose primary purpose is to transport school students over an established route to and from school for the regularly scheduled school day, that is equipped with alternately flashing red lights on the front and rear and a mechanical stop signal, and that bears the words

"School Bus" on the front and rear in letters at least 8 inches in height. The term includes a public, private, or parochial vehicle that meets this description.

(32) Public Vehicular Area.—Any area within the State of North Carolina that is generally open to and used by the public for vehicular traffic, including by way of illustration and not limitation any drive, driveway, road, roadway, street, alley, or parking lot upon the grounds and premises of:

a. Any public or private hospital, college, university, school, orphanage, church, or any of the institutions, parks or other facilities maintained and supported by the State of North Carolina or any of its subdivisions.

Safety Zone.—Traffic island or other space officially set aside within a highway for the exclusive use of pedestrians and which is so plainly marked or indicated by proper signs as to be plainly visible at all times while set apart as a safety zone.

20-160. Driving through safety zone or on sidewalks prohibited.

(a) The driver of a vehicle shall not at any time drive through or over a safety zone.

(b) No person shall drive any motor vehicle upon a sidewalk or sidewalk area except upon a permanent or temporary driveway.

20-158. Vehicle control signs and signals.

(b) Control of Vehicles at Intersections.

(2)…vehicular traffic facing a red light controlling traffic passing straight through an intersection, after coming to a complete stop at the intersection, may enter the intersection to make a right turn but such vehicle shall yield the right of way to pedestrians and to other traffic using the intersection…. When the stoplight is emitting a steady green light, vehicles may proceed with due care through the intersection subject to the rights of pedestrians and other vehicles as may otherwise be provided by law.

(c) Control of Vehicles at Places other than Intersections.

(1) When a stop sign has been erected or installed at a place other than an intersection, it shall be unlawful for the driver of any vehicle to fail to stop in obedience thereto and yield the right-of-way to pedestrians and other vehicles.

(2) When a stoplight has been erected or installed at a place other than an intersection, and is emitting a steady red light, vehicles facing the red light shall come to a complete stop. When the stoplight is emitting a steady yellow light, vehicles facing the light shall be warned that a red light will be immediately forthcoming and that vehicles may not proceed through such a red light. When the stoplight is emitting a steady green light, vehicles may proceed subject to the rights of pedestrians and other vehicles as may otherwise be provided by law.

(3) When a flashing red light has been erected or installed at a place other than an intersection, approaching vehicles facing the light shall stop and yield the right-of-way to pedestrians or other vehicles.

(4) When a flashing yellow light has been erected or installed at a place other than an intersection, approaching vehicles facing the light may proceed with caution, yielding the right-of-way to pedestrians and other vehicles.
(5) When a stoplight, stop sign, or other signaling device authorized by subsection (a) requires a vehicle to stop at a place other than an intersection, the driver shall stop at an appropriately marked stop line, or if none, before entering a marked crosswalk, or if none, before proceeding past the signaling device.

136-33.2. Signs marking beginning and ending of speed zones.

Whenever speed zones are established by any agency of the State having authority to establish such speed zones, there shall be erected or posted a sign of adequate size at the beginning point of such speed zone designating the zone and the speed limit to be observed therein, and there shall be erected or posted at the end of such speed zone an adequate sign indicating the end of such speed zone which sign shall also indicate such different speed limit as may then be observed.

At least 600 feet in advance of the beginning of any speed zone established by any agency of the State authorized to establish the same, there shall be erected a sign of adequate size which shall bear the legend "Reduce Speed Ahead."

115C-240. Authority and duties of State Board of Education.

(b) The State Board of Education shall be under no duty to supply transportation to any pupil or employee enrolled or employed in any school. Neither the State nor the State Board of Education shall in any manner be liable for the failure or refusal of any local board or education to furnish transportation, by school bus or otherwise, to any pupil or employee of any school, or for any neglect or action of any county or city board of education, or any employee of any such board, in the operation or maintenance of any school bus.

Pedestrian Laws of North Carolina

All statutes cited are from the Motor Vehicle Laws of North Carolina, which are part of the North Carolina General Statutes.

Regarding Physical Impairment

20-175. Pedestrians Soliciting Rides, Employment, Business Or Funds Upon Highways Or Streets

Public Use of White Canes by Other Than Blind Persons Prohibited-----(20-175.1)

It shall be unlawful for any person, except one who is wholly or partially blind, to carry or use on any street or highway, or in any other public place, a cane or walking stick which is white in color or white tipped with red.

Right-of-Way at Crossings, Intersections and Traffic-Control Signal Points; White Cane or Guide Dog to Serve as Signal for the Blind-----(20-175.2)

Any wholly or partially blind pedestrian crossing a roadway at any crossing or intersection which is not officer or signal controlled has right-of-way when presenting before them a white cane (or white tipped with red) or a guide dog.

Rights and Privileges of Blind Persons without White Cane or Guide Dog-----(20-175.3)

Wholly or partially blind pedestrians, when not accompanied by a cane or a guide dog, retain all privileges provided by any other pedestrian.

Use of Motorized Wheelchairs-----(20-175.5)

Persons with a mobility impairment who operate a motorized wheelchair (or similar vehicle not exceeding 1000 pounds gross weight) are subject to all regulations, and privileges, provided to any other pedestrian.

Right-of-Way

20-155. Right-of-Way

(c) Pedestrians have the right-of-way at clearly marked crosswalks in business or residential areas except where there is signalized control.

20-172. Pedestrians Subject to Traffic-Control Signals

(b, c) Pedestrians must obey the control of traffic-control signals. Pedestrians have the right-of-way when following pedestrian-control signals.

20-173. Pedestrians' Right-of-Way at Crosswalks

(a) Where traffic-control signals are not in place or in operation the driver of a vehicle shall yield the right-of-way to a pedestrian crossing the roadway within any marked crosswalk or within any unmarked crosswalk at or near an intersection.

(b) Whenever any vehicle is stopped at a crosswalk at an intersection to permit a pedestrian to cross, the driver of any other vehicle approaching from the rear shall not overtake and pass such stopped vehicle.

(c) Pedestrians have the right-of-way when approaching an alley, building entrance, private road, or driveway, from any sidewalk or walkway.

20-174. Crossing at Other Than Crosswalks; Walking along Highway

(a) Pedestrians shall yield the right-of-way when crossing a road where there is no crosswalk.

(b) Pedestrians must yield the right-of-way when crossing a road if another pedestrian crossing alternative has been provided.

(c) Pedestrians must cross only at a marked crosswalk between signalized intersections.

(d) Pedestrians must use sidewalks, when provided, rather than walk along an adjacent roadway. When sidewalks are not provided, pedestrians may walk

on roadway shoulders but must walk facing traffic and must yield right-of-way to such traffic.

Standing, Sitting or Lying upon Highways or Streets Prohibited (20-174.1)

(a) Pedestrians must NOT impede the regular flow of traffic by willfully standing, sitting, or lying upon a roadway.

20-175. Pedestrians Soliciting Rides, Employment, Business or Funds upon Highways or Streets

(a) Pedestrians must stand only on the shoulder when soliciting a ride (i.e. - hitchhiking) and not in the roadway.

(b) Pedestrians must NOT be in the roadway, on the shoulder, or on a median when soliciting business or loitering, and can only solicit business or loiter from a sidewalk.

Bicycle Laws of North Carolina

All statutes cited are from the Motor Vehicle Laws of North Carolina, which are part of the North Carolina General Statutes.

20-4. Clarification of Conflicts as to Transfer of Functions.

Definitions-----(20-4.01)

13. Highway is defined as "the entire width between property or right-of-way lines of every way or place of whatever nature, when any part thereof is open to the use of the public as a matter of right for the purposes of vehicular traffic."

(33b)`A crash is considered reportable if a minimum of $1000.00 of property damage occurs, or if any human being is injured or killed.

38. A roadway is "that portion of a highway improved, designed, or ordinarily used for vehicular travel, exclusive of the shoulder."

39. Bicycles "shall be deemed vehicles and every rider of a bicycle upon a highway shall be subject to the provisions of [Chapter 20 (Motor Vehicles) of the General Statutes of North Carolina] applicable to the driver of a vehicle, except for those laws that which by their nature can have no application.

20-129. Required Lighting Equipment of Vehicles.

(e) Lamps on Bicycles. Every bicycle shall be equipped with a lighted lamp visible up to three hundred feet in front when used at night and must also be equipped with a taillight or rear reflector that is red and visible for up to two hundred feet from the rear when used at night.

20-138. Operation of Vehicles and Rules of the Road

Impaired Driving-----20-138.1

(e) A bicycle is not considered a vehicle for purposes of impaired driving.

20-142. (Repealed by session laws)

Obedience to Railroad Signal-----20-142.1

(b) No person shall drive any vehicle through, around, or under any crossing gate or barrier at a railroad crossing while the gate or barrier is closed or is being opened or closed.

20-153. Turning at Intersections

(a) Bicyclists, while approaching and making a right-hand turn, must be, as close as is practicable, by the right-hand curb or edge of the roadway.

(b) Bicyclists must be in the left-most lawful lane when approaching an intersection or junction to make a left turn, while they make the turn and when they complete the turn.

20-154. Signals on Starting, Stopping or Turning

Signals must be given for left and right turns (and stopping) by either electrical, mechanical, or manual (arm and hand) means prior to, and during, the indicated movement.

20-155. Right-of-Way

(a) Bicyclists must yield to vehicles on its right when preparing to enter an intersection.

(b) Bicyclists must yield to vehicles approaching from the opposite direction when preparing to make a left turn.

(c) Bicyclists must yield to pedestrians if they are crossing at a crosswalk (or regular pedestrian crossing) unless traffic is being regulated by police or by traffic direction devices.

(d) Bicyclists must yield to vehicles already within a traffic circle.

20-156. Exceptions to the Right-of-Way Rule

(a) Bicyclists must yield to traffic on a main route when entering or crossing from a side street, alley, etc.

(b) Bicyclists must yield to emergency vehicles when appropriate warning signals are being given.

20-158. Vehicle Control Signs and Signals

Bicyclists must stop at steady or flashing red signalization, but after stopping may proceed to make a right on red as long as they yield the right-of-way. Bicyclists must stop and yield the right-of-way before proceeding from a stop sign. Bicyclists may proceed with caution at a flashing yellow light.

Erection of "Yield Right-of-Way" Signs-----(20-158.1)

Bicyclists must yield the right-of-way before entering or crossing any main-traveled or through highway if the roadway they are on is posted with a "yield right-of-way" sign.

20-165. (Repealed by session laws)

One-Way Traffic-----20-165.1

Bicyclists must ride in the indicated direction of traffic.

20-166. Duty to Stop in Event of Accident or Collision; Furnishing Information or Assistance to Injured Person, etc.; Persons Assisting Exempt From Civil Liability

Any vehicle involved in a crash must report the crash, remain at the scene of the crash (but may leave for a reasonable amount of time to summon law-enforcement officials and/or medical assistance) until law-enforcement officials arrive, and offer medical assistance (if capable and appropriate). (20-166, a, b, c, c1 and 20-166.1, a).

20-171. Traffic Laws Apply to Persons Riding Animals or Driving Animal-Drawn Vehicles

Definitions-----(20-171.1)

A bicycle is a non-motorized vehicle with two or three wheels tandem, a steering handle, on or two saddle seats, and pedals by which the vehicle is propelled.

Bicycle Racing-----(20-171.2)

Bicycle racing is prohibited unless approved by state or local authorities on roads of their respective jurisdictions.

20-173. Pedestrians' Right-of-Way at Crosswalks

(b) Vehicle operators of any vehicle approaching another vehicle from the rear shall not overtake and pass the stopped vehicle when it is stopped at a marked crosswalk, or at any unmarked crosswalk at an intersection, to permit a pedestrian to cross the roadway.

(c) The driver of a vehicle emerging from or entering an alley, building entrance, private road, or driveway shall yield the right-of-way to any pedestrian, or person riding a bicycle, approaching on any sidewalk or walkway extending across such alley, building entrance, road, or driveway.

20-174. Crossing at Other Than Crosswalks; Walking along Highway

(e) Bicyclists must avoid colliding with pedestrians, children, etc. that are on a roadway.

Relevant Sections of the Manual on Uniform Traffic Control Devices (MUTCD)

PART 7
TRAFFIC CONTROL FOR SCHOOL AREAS

CHAPTER 7A. GENERAL

Section 7A.01 Need for Standards

Support:

01 Regardless of the school location, the best way to achieve effective traffic control is through the uniform application of realistic policies, practices, and standards developed through engineering judgment or studies.

02 Pedestrian safety depends upon public understanding of accepted methods for efficient traffic control. This principle is especially important in the control of pedestrians, bicycles, and other vehicles in the vicinity of schools. Neither pedestrians on their way to or from school nor other road users can be expected to move safely in school areas unless they understand both the need for traffic controls and how these controls function for their benefit.

03 Procedures and devices that are not uniform might cause confusion among pedestrians and other road users, prompt wrong decisions, and contribute to crashes. To achieve uniformity of traffic control in school areas, comparable traffic situations need to be treated in a consistent manner. Each traffic control device and control method described in Part 7 fulfills a specific function related to specific traffic conditions.

04 A uniform approach to school area traffic controls assures the use of similar controls for similar situations, which promotes appropriate and uniform behavior on the part of motorists, pedestrians, and bicyclists.

05 A school traffic control plan permits the orderly review of school area traffic control needs, and the coordination of school/pedestrian safety education and engineering measures. Engineering measures alone do not always result in the intended change in student and road user behavior.

Guidance:

06 *A school route plan for each school serving elementary to high school students should be prepared in order to develop uniformity in the use of school area traffic controls and to serve as the basis for a school traffic control plan for each school.*

07 *The school route plan, developed in a systematic manner by the school, law enforcement, and traffic officials responsible for school pedestrian safety, should consist of a map (see Figure 7A-1) showing streets, the school, existing traffic controls, established school walk routes, and established school crossings.*

08 *The type(s) of school area traffic control devices used, either warning or regulatory, should be related to the volume and speed of vehicular traffic, street width, and the number and age of the students using the crossing.*

09 *School area traffic control devices should be included in a school traffic control plan.*

Support:

10 Reduced speed limit signs for school areas and crossings are included in this Manual solely for the purpose of standardizing signing for these zones and not as an endorsement of mandatory reduced speed zones.

11 "School" and "school zone" are defined in Section 1A.13.

Section 7A.02 School Routes and Established School Crossings

Support:

01 To establish a safer route to and from school for schoolchildren, the application of planning criterion for school walk routes might make it necessary for children to walk an indirect route to an established school crossing located where there is existing traffic control and to avoid the use of a direct crossing where there is no existing traffic control.

Guidance:

02 *School walk routes should be planned to take advantage of existing traffic controls.*

03 *The following factors should be considered when determining the feasibility of requiring children to walk a longer distance to a crossing with existing traffic control:*

A. The availability of adequate sidewalks or other pedestrian walkways to and from the location with existing control,
B. The number of students using the crossing,
C. The age levels of the students using the crossing, and
D. The total extra walking distance.

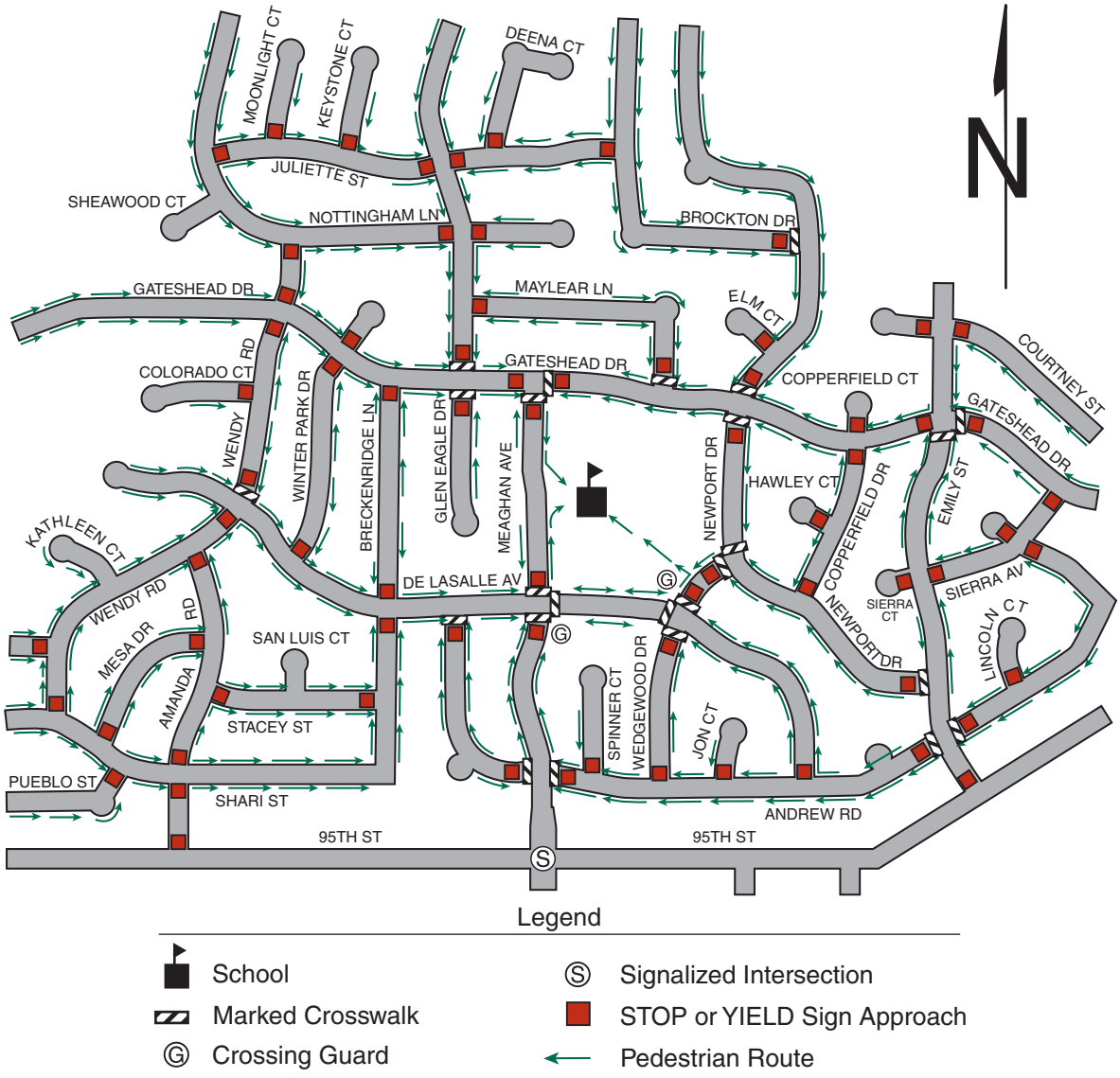
Section 7A.03 School Crossing Control Criteria

Support:

01 The frequency of gaps in the traffic stream that are sufficient for student crossing is different at each crossing location. When the delay between the occurrences of adequate gaps becomes excessive, students might become impatient and endanger themselves by attempting to cross the street during an inadequate gap. In these instances, the creation of sufficient gaps needs to be considered to accommodate the crossing demand.

02 A recommended method for determining the frequency and adequacy of gaps in the traffic stream is given in the "Traffic Control Devices Handbook" (see Section 1A.11).

Figure 7A-1. Example of School Route Plan Map



Section 7A.04 Scope

Standard:

01 **Part 7 sets forth basic principles and prescribes standards that shall be followed in the design, application, installation, and maintenance of all traffic control devices (including signs, signals, and markings) and other controls (including adult crossing guards) required for the special pedestrian conditions in school areas.**

Support:

02 Sections 1A.01 and 1A.08 contain information regarding unauthorized devices and messages. Sections 1A.02 and 1A.07 contain information regarding the application of standards. Section 1A.05 contains information regarding the maintenance of traffic control devices. Section 1A.08 contains information regarding placement authority for traffic control devices. Section 1A.09 contains information regarding engineering studies and the assistance that is available to jurisdictions that do not have engineers on their staffs who are trained and/or experienced in traffic control devices.

03 Provisions contained in Chapter 2A and Section 2B.06 are applicable in school areas.

04 Part 3 contains provisions regarding pavement markings that are applicable in school areas.

05 Part 4 contains provisions regarding highway traffic signals that are applicable in school areas. The School Crossing signal warrant is described in Section 4C.06.

CHAPTER 7B. SIGNS

Section 7B.01 Size of School Signs

Standard:

01 **Except as provided in Section 2A.11, the sizes of signs and plaques to be used on conventional roadways in school areas shall be as shown in Table 7B-1.**

02 **The sizes in the Conventional Road column shall be used unless engineering judgment determines that a minimum or oversized sign size would be more appropriate.**

03 **The sizes in the Minimum column shall be used only where traffic volumes are low and speeds are 30 mph or lower, as determined by engineering judgment.**

04 **The sizes in the Oversized column shall be used on expressways.**

Guidance:

05 *The sizes in the Oversized column should be used on roadways that have four or more lanes with posted speed limits of 40 mph or higher.*

Option:

06 The sizes in the Oversized column may also be used at other locations that require increased emphasis, improved recognition, or increased legibility.

07 Signs and plaques larger than those shown in Table 7B-1 may be used (see Section 2A.11).

Table 7B-1. School Area Sign and Plaque Sizes

Sign	Sign Designation	Section	Conventional Road	Minimum	Oversized
School	S1-1	7B.08	36 x 36	30 x 30	48 x 48
School Bus Stop Ahead	S3-1	7B.13	36 x 36	30 x 30	48 x 48
School Bus Turn Ahead	S3-2	7B.14	36 x 36	30 x 30	48 x 48
Reduced School Speed Limit Ahead	S4-5, S4-5a	7B.16	36 x 36	30 x 30	48 x 48
School Speed Limit XX When Flashing	S5-1	7B.15	24 x 48	—	36 x 72
End School Zone	S5-2	7B.09	24 x 30	—	36 x 48
End School Speed Limit	S5-3	7B.15	24 x 30	—	36 x 48
In-Street Ped Crossing	R1-6, R1-6a, R1-6b, R1-6c	7B.11, 7B.12	12 x 36	—	—
Speed Limit (School Use)	R2-1	7B.15	24 x 30	—	36 x 48
Begin Higher Fines Zone	R2-10	7B.10	24 x 30	—	36 x 48
End Higher Fines Zone	R2-11	7B.10	24 x 30	—	36 x 48

Plaque	Sign Designation	Section	Conventional Road	Minimum	Oversized
X:XX to X:XX AM X:XX to X:XX PM	S4-1P	7B.15	24 x 10	—	36 x 18
When Children Are Present	S4-2P	7B.15	24 x 10	—	36 x 18
School	S4-3P	7B.09, 7B.15	24 x 8	—	36 x 12
When Flashing	S4-4P	7B.15	24 x 10	—	36 x 18
Mon-Fri	S4-6P	7B.15	24 x 10	—	36 x 18
All Year	S4-7P	7B.09	24 x 12	—	30 x 18
Fines Higher	R2-6P	7B.10	24 x 18	—	36 x 24
XX Feet	W16-2P	7B.08	24 x 18	—	30 x 24
XX Ft	W16-2aP	7B.08	24 x 12	—	30 x 18
Turn Arrow	W16-5P	7B.08, 7B.09, 7B.11	24 x 12	—	30 x 18
Advance Turn Arrow	W16-6P	7B.08, 7B.09, 7B.11	24 x 12	—	30 x 18
Diagonal Arrow	W16-7P	7B.12	24 x 12	—	30 x 18
Diagonal Arrow (optional size)	W16-7P	7B.12	21 x 15	—	—
Ahead	W16-9P	7B.11	24 x 12	—	30 x 18

Note: 1. Larger sizes may be used when appropriate
2. Dimensions are shown in inches and are shown as width x height
3. Minimum sign sizes for multi-lane conventional roads shall be as shown in the Conventional Road column

Section 7B.02 Illumination and Reflectorization

Standard:

01 **The signs used for school area traffic control shall be retroreflectorized or illuminated.**

Section 7B.03 Position of Signs

Support:

01 Sections 2A.16 and 2A.17 contain provisions regarding the placements and locations of signs.

02 Section 2A.19 contains provisions regarding the lateral offsets of signs.

Option:

03 In-roadway signs for school traffic control areas may be used consistent with the requirements of Sections 2B.12, 7B.08, and 7B.12.

Section 7B.04 Height of Signs

Support:

01 Section 2A.18 contains provisions regarding the mounting height of signs.

Section 7B.05 Installation of Signs

Support:

01 Section 2A.16 contains provisions regarding the installation of signs.

Section 7B.06 Lettering

Support:

01 The "Standard Highway Signs and Markings" book (see Section 1A.11) contains information regarding sign lettering.

Section 7B.07 Sign Color for School Warning Signs

Standard:

01 **School warning signs, including the "SCHOOL" portion of the School Speed Limit (S5-1) sign and including any supplemental plaques used in association with these warning signs, shall have a fluorescent yellow-green background with a black legend and border unless otherwise provided in this Manual for a specific sign.**

Section 7B.08 School Sign (S1-1) and Plaques

Support:

01 Many state and local jurisdictions find it beneficial to advise road users that they are approaching a school that is adjacent to a highway, where additional care is needed, even though no school crossing is involved and the speed limit remains unchanged. Additionally, some jurisdictions designate school zones that have a unique legal standing in that fines for speeding or other traffic violations within designated school zones are increased or special enforcement techniques such as photo radar systems are used. It is important and sometimes legally necessary to mark the beginning and end points of these designated school zones so that the road user is given proper notice.

02 The School (S1-1) sign (see Figure 7B-1) has the following four applications:

A. School Area – the S1-1 sign can be used to warn road users that they are approaching a school area that might include school buildings or grounds, a school crossing, or school related activity adjacent to the highway.
B. School Zone – the S1-1 sign can be used to identify the location of the beginning of a designated school zone (see Section 7B.09).
C. School Advance Crossing – if combined with an AHEAD (W16-9P) plaque or an XX FEET (W16-2P or W16-2aP) plaque to comprise the School Advance Crossing assembly, the S1-1 sign can be used to warn road users that they are approaching a crossing where schoolchildren cross the roadway (see Section 7B.11).
D. School Crossing – if combined with a diagonal downward pointing arrow (W16-7P) plaque to comprise the School Crossing assembly, the S1-1 sign can be used to warn approaching road users of the location of a crossing where schoolchildren cross the roadway (see Section 7B.12).

Option:

03 If a school area is located on a cross street in close proximity to the intersection, a School (S1-1) sign with a supplemental arrow (W16-5P or W16-6P) plaque may be installed on each approach of the street or highway to warn road users making a turn onto the cross street that they will encounter a school area soon after making the turn.

Figure 7B-1. School Area Signs

School Advance Crossing Assembly

S1-1

W16-9P

OR

W16-2aP

OR

W16-2P

OR

W16-5P (optional)

OR

W16-6P (optional)

School Crossing Assembly

S1-1

W16-7P

School Zone Sign

S1-1

S4-7P (optional)

S4-3P (optional)

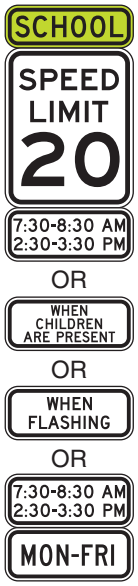
OR

W16-5P (optional)

OR

W16-6P (optional)

School Speed Limit Assembly



S4-3P

R2-1

S4-1P

OR

S4-2P

OR

S4-4P

OR

S4-1P

S4-6P

S3-1

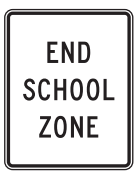
S3-2

S4-5

S4-5a

S5-1

R2-6P (optional)



S5-2

S5-3

R2-10

R2-11

Section 7B.09 School Zone Sign (S1-1) and Plaques (S4-3P, S4-7P) and END SCHOOL ZONE Sign (S5-2)

Standard:

01 **If a school zone has been designated under State or local statute, a School (S1-1) sign (see Figure 7B-1) shall be installed to identify the beginning point(s) of the designated school zone (see Figure 7B-2).**

Option:

02 A School Zone (S1-1) sign may be supplemented with a SCHOOL (S4-3P) plaque (see Figure 7B-1).

03 A School Zone (S1-1) sign may be supplemented with an ALL YEAR (S4-7P) plaque (see Figure 7B-1) if the school operates on a 12-month schedule.

04 The downstream end of a designated school zone may be identified with an END SCHOOL ZONE (S5-2) sign (see Figures 7B-1 and 7B-2).

05 If a school zone is located on a cross street in close proximity to the intersection, a School Zone (S1-1) sign with a supplemental arrow (W16-5P or W16-6P) plaque may be installed on each approach of the street or highway to warn road users making a turn onto the cross street that they will encounter a school zone soon after making the turn.

Section 7B.10 Higher Fines Zone Signs (R2-10, R2-11) and Plaques

Standard:

01 **Where increased fines are imposed for traffic violations within a designated school zone, a BEGIN HIGHER FINES ZONE (R2-10) sign (see Figure 7B-1) or a FINES HIGHER (R2-6P), FINES DOUBLE (R2-6aP), or $XX FINE (R2-6bP) plaque (see Figure 2B-3) shall be installed as a supplement to the School Zone (S1-1) sign to identify the beginning point of the higher fines zone (see Figures 7B-2 and 7B-3).**

Option:

02 Where appropriate, one of the following plaques may be mounted below the sign that identifies the beginning point of the higher fines zone:

A. An S4-1P plaque (see Figure 7B-1) specifying the times that the higher fines are in effect,
B. A WHEN CHILDREN ARE PRESENT (S4-2P) plaque (see Figure 7B-1), or
C. A WHEN FLASHING (S4-4P) plaque (see Figure 7B-1) if used in conjunction with a yellow flashing beacon.

Standard:

03 **Where a BEGIN HIGHER FINES ZONE (R2-10) sign or a FINES HIGHER (R2-6P) plaque supplementing a School Zone (S1-1) sign is posted to notify road users of increased fines for traffic violations, an END HIGHER FINES ZONE (R2-11) sign (see Figure 7B-1) or an END SCHOOL ZONE (S5-2) sign shall be installed at the downstream end of the zone to notify road users of the termination of the increased fines zone (see Figures 7B-2 and 7B-3).**

Section 7B.11 School Advance Crossing Assembly

Standard:

01 **The School Advance Crossing assembly (see Figure 7B-1) shall consist of a School (S1-1) sign supplemented with an AHEAD (W16-9P) plaque or an XX FEET (W16-2P or W16-2aP) plaque.**

02 **Except as provided in Paragraph 3, a School Advance Crossing assembly shall be used in advance (see Table 2C-4 for advance placement guidelines) of the first School Crossing assembly (see Section 7B.12) that is encountered in each direction as traffic approaches a school crosswalk (see Figure 7B-4).**

Option:

03 The School Advance Crossing assembly may be omitted (see Figure 7B-5) where a School Zone (S1-1) sign (see Section 7B.09) is installed to identify the beginning of a school zone in advance of the School Crossing assembly.

04 If a school crosswalk is located on a cross street in close proximity to an intersection, a School Advance Crossing assembly with a supplemental arrow (W16-5P or W16-6P) plaque may be installed on each approach of the street or highway to warn road users making a turn onto the cross street that they will encounter a school crosswalk soon after making the turn.

05 A 12-inch reduced size in-street School (S1-1) sign (see Figure 7B-6), installed in compliance with the mounting height and special mounting support requirements for In-Street Pedestrian Crossing (R1-6 or R1-6a) signs (see Section 2B.12), may be used in advance of a school crossing to supplement the post-mounted school warning signs. A 12 x 6-inch reduced size AHEAD (W16-9P) plaque may be mounted below the reduced size in-street School (S1-1) sign.

Figure 7B-2. Example of Signing for a Higher Fines School Zone without a School Crossing

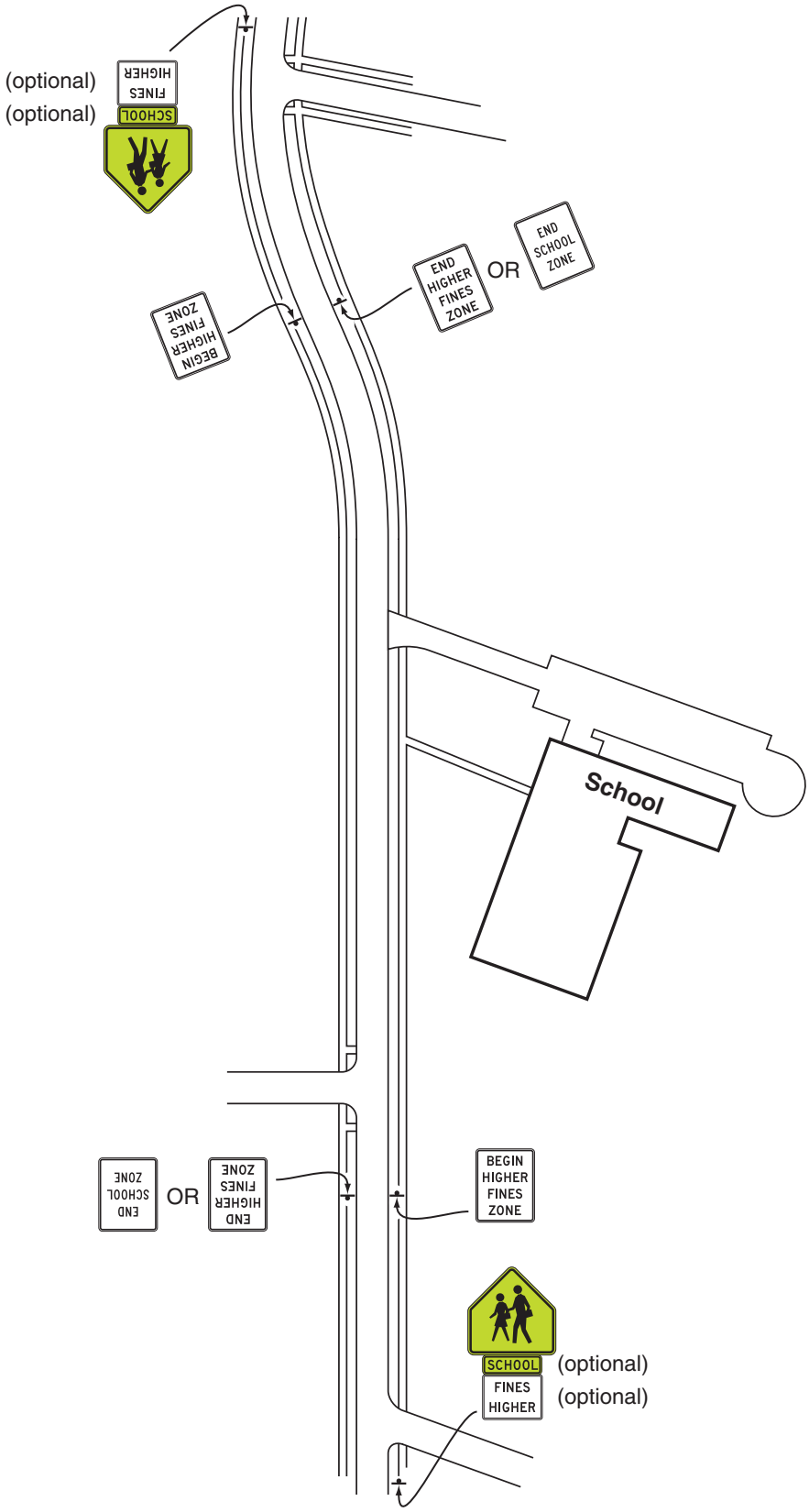


Figure 7B-3. Example of Signing for a Higher Fines School Zone with a School Speed Limit

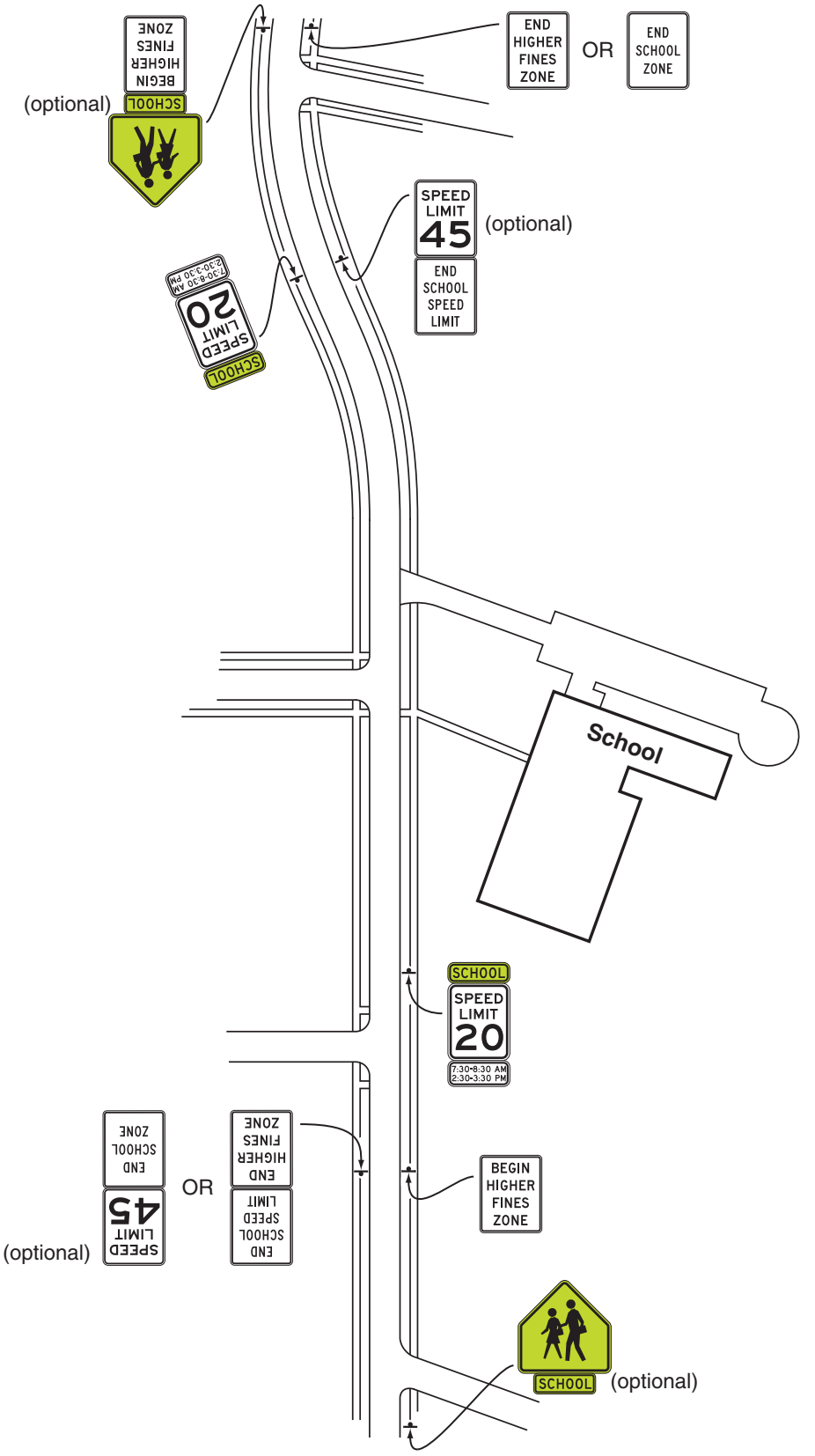


Figure 7B-4. Example of Signing for a School Crossing Outside of a School Zone

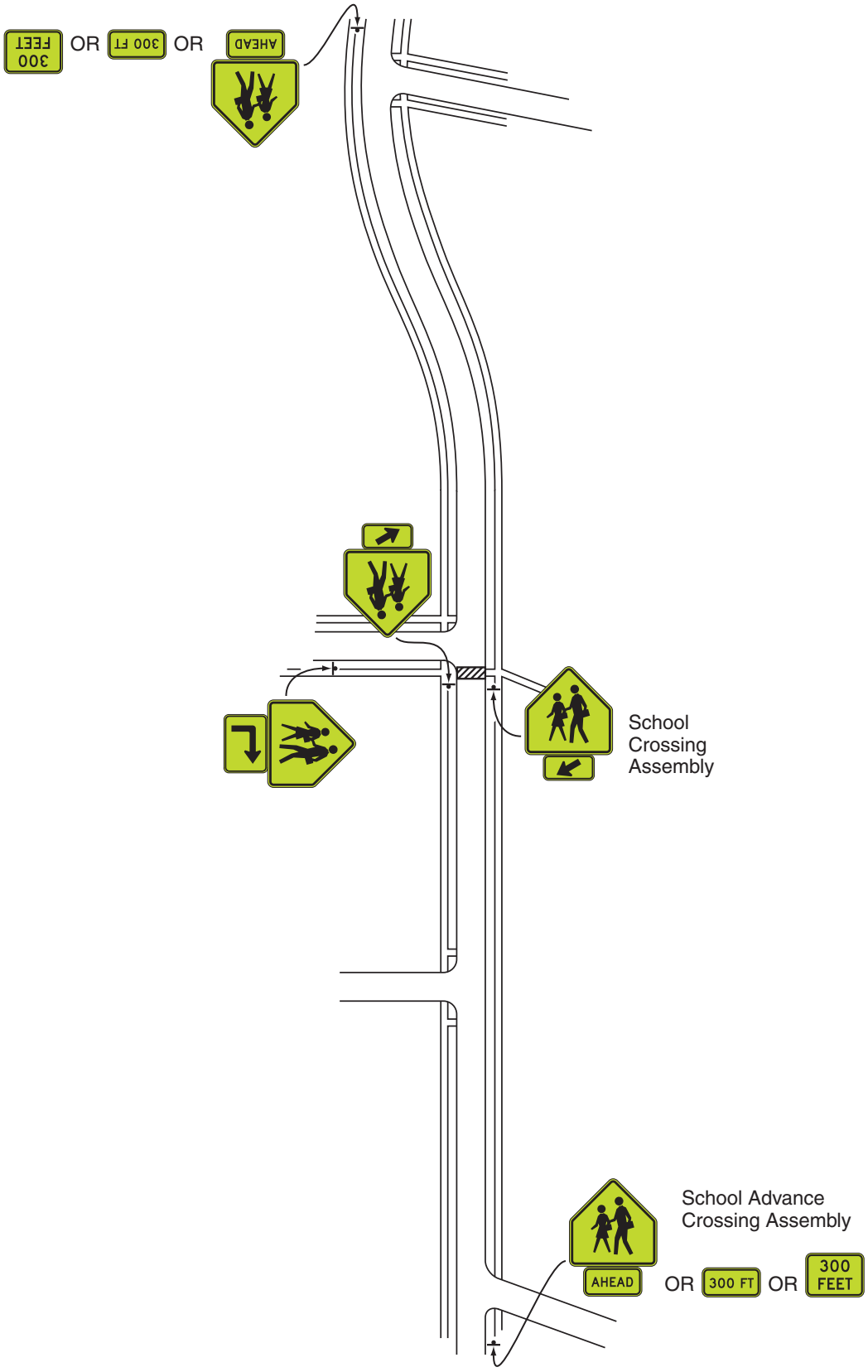


Figure 7B-5. Example of Signing for a School Zone with a School Speed Limit and a School Crossing

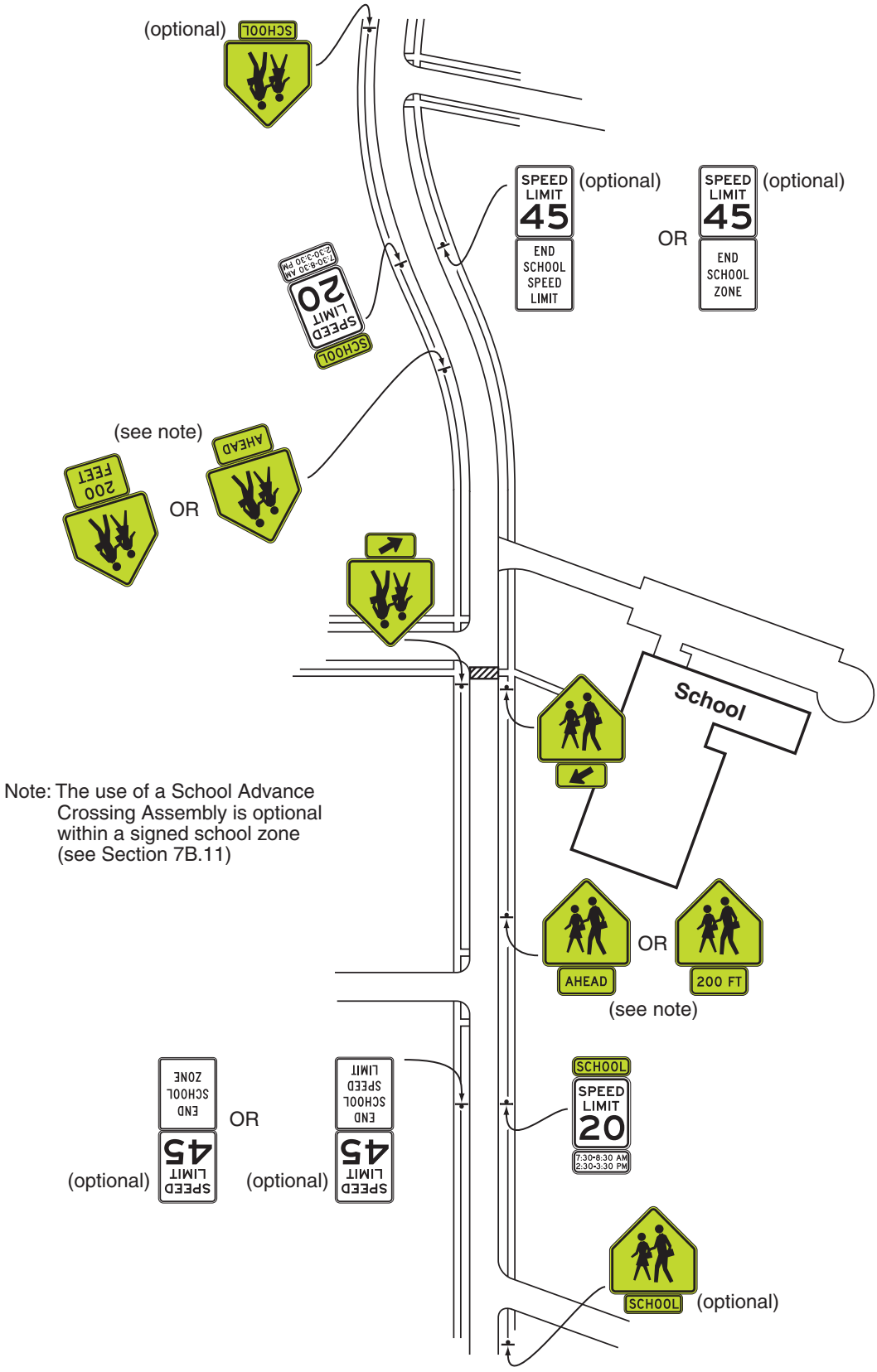


Figure 7B-6. In-Street Signs in School Areas

A - In advance of the school crossing

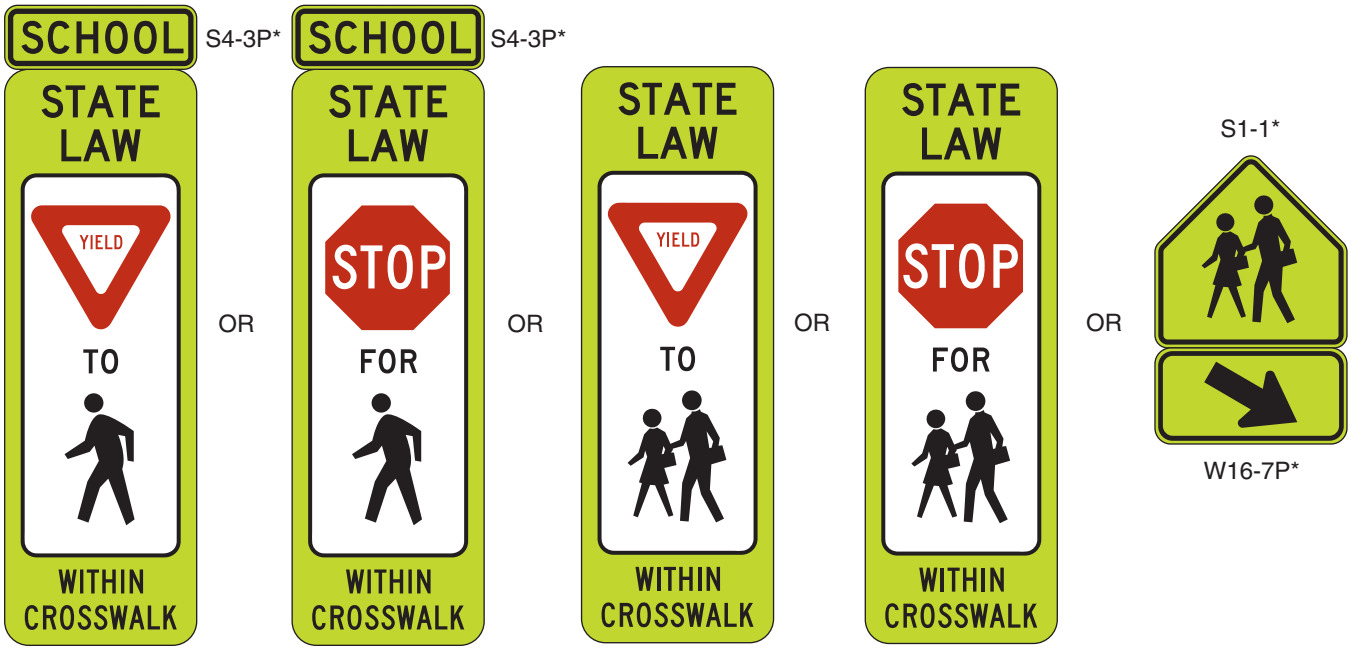
S1-1*

W16-9P*

* Reduced size signs:

S1-1	12 x 12 inches
S4-3P	12 x 4 inches
W16-7P	12 x 6 inches
W16-9P	12 x 6 inches

B - At the school crossing



S4-3P*

S4-3P*

S1-1*

W16-7P*

R1-6 R1-6a R1-6b R1-6c

Notes:

1. The use of the STATE LAW legend is optional on the R1-6 series signs (see Section 7B.12).
2. The use of the SCHOOL plaque above the R1-6 and R1-6a signs is optional.

Section 7B.12 School Crossing Assembly

Standard:

01 **If used, the School Crossing assembly (see Figure 7B-1) shall be installed at the school crossing (see Figures 7B-4 and 7B-5), or as close to it as possible, and shall consist of a School (S1-1) sign supplemented with a diagonal downward pointing arrow (W16-7P) plaque to show the location of the crossing.**

02 **The School Crossing assembly shall not be used at crossings other than those adjacent to schools and those on established school pedestrian routes.**

03 **The School Crossing assembly shall not be installed on approaches controlled by a STOP or YIELD sign.**

Option:

04 The In-Street Pedestrian Crossing (R1-6 or R1-6a) sign (see Section 2B.12 and Figure 7B-6) or the In-Street Schoolchildren Crossing (R1-6b or R1-6c) sign (see Figure 7B-6) may be used at unsignalized school crossings. If used at a school crossing, a 12 x 4-inch SCHOOL (S4-3P) plaque (see Figure 7B-6) may be mounted above the sign. The STATE LAW legend on the R1-6 series signs may be omitted.

05 The Overhead Pedestrian Crossing (R1-9 or R1-9a) sign (see Section 2B.12 and Figure 2B-2) may be modified to replace the standard pedestrian symbol with the standard schoolchildren symbol and may be used at unsignalized school crossings. The STATE LAW legend on the R1-9 series signs may be omitted.

06 A 12-inch reduced size in-street School (S1-1) sign (see Figure 7B-6) may be used at an unsignalized school crossing instead of the In-Street Pedestrian Crossing (R1-6 or R1-6a) or the In-Street Schoolchildren Crossing (R1-6b or R1-6c) sign. A 12 x 6-inch reduced size diagonal downward pointing arrow (W16-7P) plaque may be mounted below the reduced size in-street School (S1-1) sign.

Standard:

07 **If an In-Street Pedestrian Crossing sign, an In-Street Schoolchildren Crossing sign, or a reduced size in-street School (S1-1) sign is placed in the roadway, the sign support shall comply with the mounting height and special mounting support requirements for In-Street Pedestrian Crossing (R1-6 or R1-6a) signs (see Section 2B.12).**

08 **The In-Street Pedestrian Crossing sign, the In-Street Schoolchildren Crossing sign, the Overhead Pedestrian Crossing sign, and the reduced size in-street School (S1-1) sign shall not be used at signalized locations.**

Section 7B.13 School Bus Stop Ahead Sign (S3-1)

Guidance:

01 *The School Bus Stop Ahead (S3-1) sign (see Figure 7B-1) should be installed in advance of locations where a school bus, when stopped to pick up or discharge passengers, is not visible to road users for an adequate distance and where there is no opportunity to relocate the school bus stop to provide adequate sight distance.*

Section 7B.14 SCHOOL BUS TURN AHEAD Sign (S3-2)

Option:

01 The SCHOOL BUS TURN AHEAD (S3-2) sign (see Figure 7B-1) may be installed in advance of locations where a school bus turns around on a roadway at a location not visible to approaching road users for a distance as determined by the "0" column under Condition B of Table 2C-4, and where there is no opportunity to relocate the school bus turn around to provide the distance provided in Table 2C-4.

Section 7B.15 School Speed Limit Assembly (S4-1P, S4-2P, S4-3P, S4-4P, S4-6P, S5-1) and END SCHOOL SPEED LIMIT Sign (S5-3)

Standard:

01 **A School Speed Limit assembly (see Figure 7B-1) or a School Speed Limit (S5-1) sign (see Figure 7B-1) shall be used to indicate the speed limit where a reduced school speed limit zone has been established based upon an engineering study or where a reduced school speed limit is specified for such areas by statute. The School Speed Limit assembly or School Speed Limit sign shall be placed at or as near as practical to the point where the reduced school speed limit zone begins (see Figures 7B-3 and 7B-5).**

02 **If a reduced school speed limit zone has been established, a School (S1-1) sign shall be installed in advance (see Table 2C-4 for advance placement guidelines) of the first School Speed Limit sign assembly or S5-1 sign that is encountered in each direction as traffic approaches the reduced school speed limit zone (see Figures 7B-3 and 7B-5).**

03 **Where increased fines are imposed for traffic violations within a reduced school speed limit zone, a FINES HIGHER (R2-6P), FINES DOUBLE (R2-6aP), or $XX FINE (R2-6bP) plaque (see Figure 2B-3) shall be installed as a supplement to the reduced school speed limit sign to notify road users.**

04 **Except as provided in Paragraph 5, the downstream end of an authorized and posted reduced school speed limit zone shall be identified with an END SCHOOL SPEED LIMIT (S5-3) sign (see Figures 7B-1 and 7B-5).**

Option:

05 If a reduced school speed limit zone ends at the same point as a higher fines zone, an END SCHOOL ZONE (S5-2) sign may be used instead of a combination of an END HIGHER FINES ZONE (R2-11) sign and an END SCHOOL SPEED LIMIT (S5-3) sign.

06 A standard Speed Limit sign showing the speed limit for the section of highway that is downstream from the authorized and posted reduced school speed limit zone may be mounted on the same post above the END SCHOOL SPEED LIMIT (S5-3) sign or the END SCHOOL ZONE (S5-2) sign.

Guidance:

07 *The beginning point of a reduced school speed limit zone should be at least 200 feet in advance of the school grounds, a school crossing, or other school related activities; however, this 200-foot distance should be increased if the reduced school speed limit is 30 mph or higher.*

Standard:

08 **The School Speed Limit assembly shall be either a fixed-message sign assembly or a changeable message sign.**

09 **The fixed-message School Speed Limit assembly shall consist of a top plaque (S4-3P) with the legend SCHOOL, a Speed Limit (R2-1) sign, and a bottom plaque (S4-1P, S4-2P, S4-4P, or S4-6P) indicating the specific periods of the day and/or days of the week that the special school speed limit is in effect (see Figure 7B-1).**

Option:

10 Changeable message signs (see Chapter 2L and Section 6F.60) may be used to inform drivers of the school speed limit. If the sign is internally illuminated, it may have a white legend on a black background. Changeable message signs with flashing beacons may be used for situations where greater emphasis of the special school speed limit is needed.

Guidance:

11 *Even though it might not always be practical because of special features to make changeable message signs conform in all respects to the standards in this Manual for fixed-message signs, during the periods that the school speed limit is in effect, their basic shape, message, legend layout, and colors should comply with the standards for fixed-message signs.*

12 *A confirmation light or device to indicate that the speed limit message is in operation should be considered for inclusion on the back of the changeable message sign.*

Standard:

13 **Fluorescent yellow-green pixels shall be used when the "SCHOOL" message is displayed on a changeable message sign for a school speed limit.**

Option:

14 Changeable message signs may use blank-out messages or other methods in order to display the school speed limit only during the periods it applies.

15 Changeable message signs that display the speed of approaching drivers (see Section 2B.13) may be used in a school speed limit zone.

16 A Speed Limit Sign Beacon (see Section 4L.04) also may be used, with a WHEN FLASHING legend, to identify the periods that the school speed limit is in effect.

Section 7B.16 Reduced School Speed Limit Ahead Sign (S4-5, S4-5a)

Guidance:

01 *A Reduced School Speed Limit Ahead (S4-5, S4-5a) sign (see Figure 7B-1) should be used to inform road users of a reduced speed zone where the speed limit is being reduced by more than 10 mph, or where engineering judgment indicates that advance notice would be appropriate.*

Standard:

02 **If used, the Reduced School Speed Limit Ahead sign shall be followed by a School Speed Limit sign or a School Speed Limit assembly.**

03 **The speed limit displayed on the Reduced School Speed Limit Ahead sign shall be identical to the speed limit displayed on the subsequent School Speed Limit sign or School Speed Limit assembly.**

Section 7B.17 Parking and Stopping Signs (R7 and R8 Series)

Option:

01 Parking and stopping regulatory signs may be used to prevent parked or waiting vehicles from blocking pedestrians' views, and drivers' views of pedestrians, and to control vehicles as a part of the school traffic plan.

Support:

02 Parking signs and other signs governing the stopping and standing of vehicles in school areas cover a wide variety of regulations. Typical examples of regulations are as follows:

A. No Parking X:XX AM to X:XX PM School Days Only,
B. No Stopping X:XX AM to X:XX PM School Days Only,
C. XX Min Loading X:XX AM to X:XX PM School Days Only, and
D. No Standing X:XX AM to X:XX PM School Days Only.

03 Sections 2B.46, 2B.47, and 2B.48 contain information regarding the signing of parking regulations in school zone areas.

CHAPTER 7C. MARKINGS

Section 7C.01 Functions and Limitations

Support:

01 Markings have definite and important functions in a proper scheme of school area traffic control. In some cases, they are used to supplement the regulations or warnings provided by other devices, such as traffic signs or signals. In other instances, they are used alone and produce results that cannot be obtained by the use of any other device. In such cases they serve as an effective means of conveying certain regulations, guidance, and warnings that could not otherwise be made clearly understandable.

02 Pavement markings have some potential limitations. They might be obscured by snow, might not be clearly visible when wet, and might not be durable when subjected to heavy traffic. In spite of these potential limitations, they have the advantage, under favorable conditions, of conveying warnings or information to the road user without diverting attention from the road.

Section 7C.02 Crosswalk Markings

Guidance:

01 *Crosswalks should be marked at all intersections on established routes to a school where there is substantial conflict between motorists, bicyclists, and student movements; where students are encouraged to cross between intersections; where students would not otherwise recognize the proper place to cross; or where motorists or bicyclists might not expect students to cross (see Figure 7A-1).*

02 *Crosswalk lines should not be used indiscriminately. An engineering study considering the factors described in Section 3B.18 should be performed before a marked crosswalk is installed at a location away from a traffic control signal or an approach controlled by a STOP or YIELD sign.*

03 *Because non-intersection school crossings are generally unexpected by the road user, warning signs (see Sections 7B.11 and 7B.12) should be installed for all marked school crosswalks at non-intersection locations. Adequate visibility of students by approaching motorists and of approaching motorists by students should be provided by parking prohibitions or other appropriate measures.*

Support:

04 Section 3B.18 contains provisions regarding the placement and design of crosswalks, and Section 3B.16 contains provisions regarding the placement and design of the stop lines and yield lines that are associated with them. Provisions regarding the curb markings that can be used to establish parking regulations on the approaches to crosswalks are contained in Section 3B.23.

Section 7C.03 Pavement Word, Symbol, and Arrow Markings

Option:

01 If used, the SCHOOL word marking may extend to the width of two approach lanes (see Figure 7C-1).

Guidance:

02 *If the two-lane SCHOOL word marking is used, the letters should be 10 feet or more in height.*

Support:

03 Section 3B.20 contains provisions regarding other word, symbol, and arrow pavement markings that can be used to guide, warn, or regulate traffic.

Figure 7C-1. Two-Lane Pavement Marking of "SCHOOL"

CHAPTER 7D. CROSSING SUPERVISION

Section 7D.01 Types of Crossing Supervision

Support:

01 There are three types of school crossing supervision:

A. Adult control of pedestrians and vehicles by adult crossing guards,
B. Adult control of pedestrians and vehicles by uniformed law enforcement officers, and
C. Student and/or parent control of only pedestrians with student and/or parent patrols.

02 Information regarding the organization, administration, and operation of a school safety patrol program is contained in the "AAA School Safety Patrol Operations Manual" (see Section 1A.11).

Section 7D.02 Adult Crossing Guards

Option:

01 Adult crossing guards may be used to provide gaps in traffic at school crossings where an engineering study has shown that adequate gaps need to be created (see Section 7A.03), and where authorized by law.

Section 7D.03 Qualifications of Adult Crossing Guards

Support:

01 High standards for selection of adult crossing guards are essential because they are responsible for the safety of and the efficient crossing of the street by schoolchildren within and in the immediate vicinity of school crosswalks.

Guidance:

02 *Adult crossing guards should possess the following minimum qualifications:*

A. Average intelligence;
B. Good physical condition, including sight, hearing, and ability to move and maneuver quickly in order to avoid danger from errant vehicles;
C. Ability to control a STOP paddle effectively to provide approaching road users with a clear, fully direct view of the paddle's STOP message during the entire crossing movement;
D. Ability to communicate specific instructions clearly, firmly, and courteously;
E. Ability to recognize potentially dangerous traffic situations and warn and manage students in sufficient time to avoid injury.
F. Mental alertness;
G. Neat appearance;
H. Good character;
I. Dependability; and
J. An overall sense of responsibility for the safety of students.

Section 7D.04 Uniform of Adult Crossing Guards

Standard:

01 **Law enforcement officers performing school crossing supervision and adult crossing guards shall wear high-visibility retroreflective safety apparel labeled as ANSI 107-2004 standard performance for Class 2 as described in Section 6E.02.**

Section 7D.05 Operating Procedures for Adult Crossing Guards

Standard:

01 **Adult crossing guards shall not direct traffic in the usual law enforcement regulatory sense. In the control of traffic, they shall pick opportune times to create a sufficient gap in the traffic flow. At these times, they shall stand in the roadway to indicate that pedestrians are about to use or are using the crosswalk, and that all vehicular traffic must stop.**

02 **Adult crossing guards shall use a STOP paddle. The STOP paddle shall be the primary hand-signaling device.**

03 **The STOP (R1-1) paddle shall be an octagonal shape. The background of the STOP face shall be red with at least 6-inch series upper-case white letters and border. The paddle shall be at least 18 inches in size and have the word message STOP on both sides. The paddle shall be retroreflectorized or illuminated when used during hours of darkness.**

Option:

04 The STOP paddle may be modified to improve conspicuity by incorporating white or red flashing lights on both sides of the paddle. Among the types of flashing lights that may be used are individual LEDs or groups of LEDs.

05 The white or red flashing lights or LEDs may be arranged in any of the following patterns:

A. Two white or red lights centered vertically above and below the STOP legend,
B. Two white or red lights centered horizontally on each side of the STOP legend,
C. One white or red light centered below the STOP legend,
D. A series of eight or more small white or red lights having a diameter of 1/4 inch or less along the outer edge of the paddle, arranged in an octagonal pattern at the eight corners of the STOP paddle (more than eight lights may be used only if the arrangement of the lights is such that it clearly conveys the octagonal shape of the STOP paddle), or
E. A series of white lights forming the shapes of the letters in the legend.

Standard:

06 **If flashing lights are used on the STOP paddle, the flash rate shall be at least 50, but no more than 60, flash periods per minute.**

North Carolina Pedestrian Crash Statistics*

Through the capabilities of technology and investment by the Division of Bicycle and Pedestrian Transportation, information from more than 9,000 recent bicycle and pedestrian crashes with motor vehicles has been compiled to create an interactive database that covers the whole state of North Carolina. This unique resource is designed for researching and analyzing bicycle and pedestrian crash data in North Carolina.

Created and housed at the University of North Carolina Highway Safety Research Center, this resource puts important data at the fingertips of planners, engineers, government officials, and citizens who are interested in analyzing bicycle and pedestrian crashes in their communities**.**

The following pages provide a look at a five year summary of data. For further crash data visit www.pedbikeinfo.org/pbcat/.

PEDESTRIAN CRASH FACTS SUMMARY, 2003-2007

Trends

Over the past five years in North Carolina (NC), an average of more than 2,500 pedestrian-motor vehicle collisions has been reported to the NC Division of Motor Vehicles. On average, more than 170 pedestrians were killed and around 250 were reported seriously injured in each of the past five years with many more suffering evident or possible injuries (Figure 1).

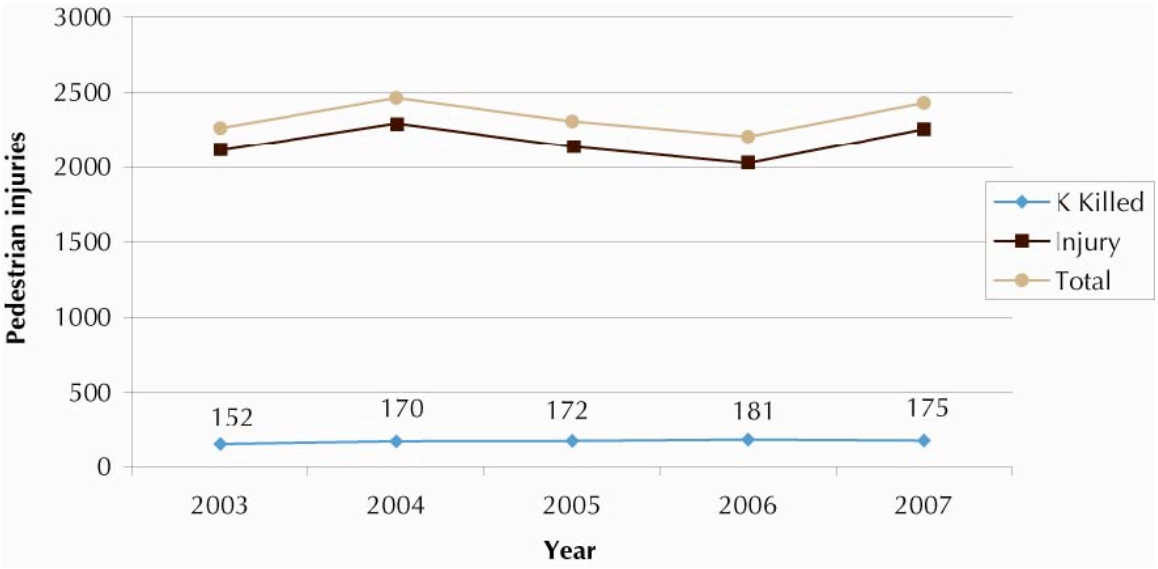


Figure 1. Five year trend of NC pedestrian fatalities and injuries due to reported collisions with motor vehicles, 2003 - 2007. (Counts are of pedestrians. The totals reflected in this figure do not include pedestrians reported being involved in collisions for whom unknown or no injuries were indicated.)

The ten year trend since 1998 has seen an increase in the number of pedestrian crashes (Figure 2). An average of 2503 crashes occurred in the latest 5-year period compared with an average of 2260 in the first five years. This represents an increase in pedestrian collisions of about 11% for the recent five years compared to 1998-2002. The peak for the current five year period was 2587 crashes in 2004, although 2007 was close behind with 2563.

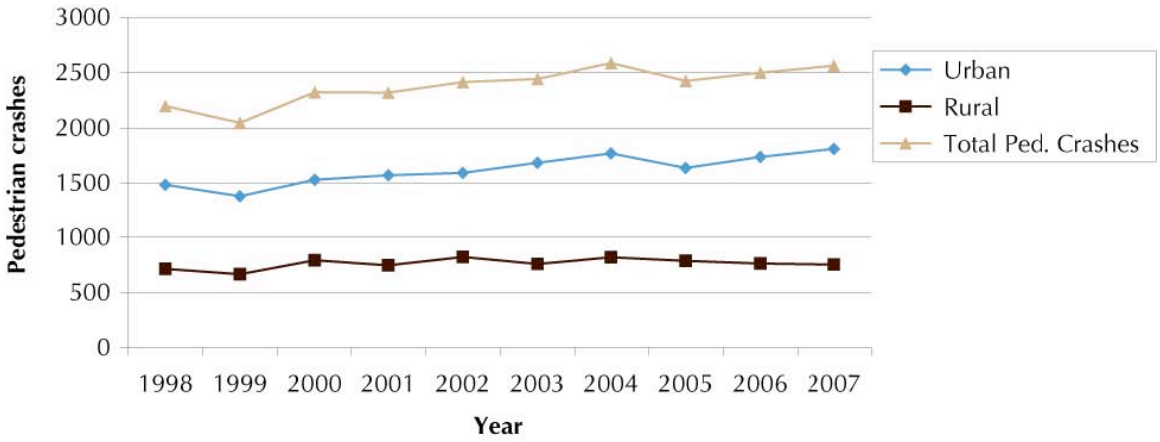


Figure 2. Pedestrian crash trends, 1998 – 2007. Rural crashes have fluctuated but remained fairly flat over the 10-year time period, while urban crashes have climbed more steadily and account for most of the increase in pedestrian crashes. (Counts are of crashes.)

As can be seen in Figure 2, most of the increase has been in urban pedestrian crashes, with rural crashes initially increasing and then declining in recent years. The increase may reflect greater population growth in urban areas and other factors. Adult pedestrians also account for the largest share of those involved in the greater number of crashes, especially in recent years (Figure 3).

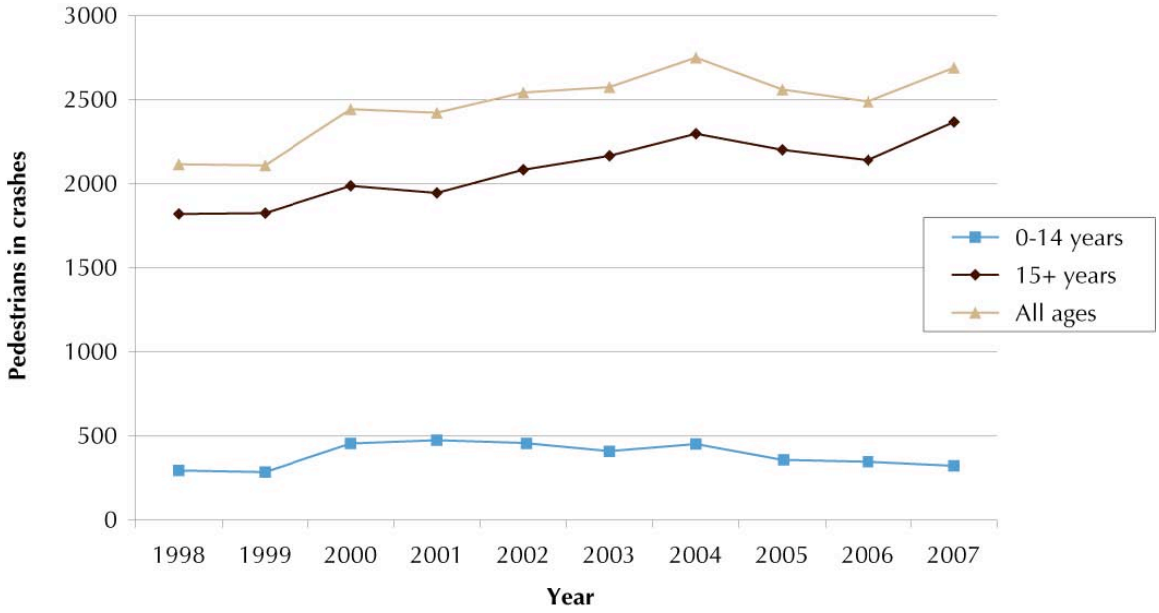


Figure 3. Pedestrian crash-involvement by age, 1998 - 2007. Nearly 30% more adults aged 15 and up (includes those of unknown age) were involved in collisions in 2007 than in 1998. Child pedestrian involvement was higher in the middle years, 2000 – 2004, but since has dropped off. (Counts are of pedestrians.)

This report summarizes roadway, environmental, and person characteristics of pedestrian-motor vehicle crashes that were reported statewide for this five year period. (These data include collisions which were not officially "reportable" but had been reported. Non-reportable collisions would not be included in other state crash statistics.) There were 12,517 pedestrian crashes with motor vehicles reported for all five years. These crashes involved about 13,071 pedestrians (due to multiple pedestrians' involvement in some crashes) and 14,267 drivers. As with all crash data, the reported numbers in the crash characteristics that follow undoubtedly reflect some error, including errors in officers' coding of crashes, as well as errors made during data entry and recoding of the data.

Where do most NC Pedestrian Crashes Occur

More than two-thirds of pedestrian collisions in NC occurred in urban areas over the most recent five years, with about one-third occurring in non-incorporated areas (Table 1). These data are coded based on whether the crash was indicated as occurring within municipal boundaries (urban), or not (rural), and may not reflect area land use. Based on 2007 population data, the five-year urban (within municipalities) yearly pedestrian crash rate averages 3.5 per 10,000 population, and 1.9 per 10,000 population in unincorporated (more rural) areas of the state. (Municipal population statewide was estimated at 4,962,027 and 4,107,317 for unincorporated areas, 2007. Population estimates are from the Office of State Budget and Management, Municipal and Non-Municipal Population by County, retrieved from **http://www.osbm.state.nc.us/ncosbm/facts_and_figures/socioeconomic_data/population_estimates/demog/ctotm07.htm**).

The difference in rural and urban crash rates likely reflect greater exposure in urban areas where sidewalks, transit use, compact development and other opportunities for walking are typically greater than in rural areas of the state.

Table 1. Number and percentage of rural and urban pedestrian crashes statewide

Rural/Urban Crash Location	YEAR					Total
	2003	2004	2005	2006	2007	
Rural	758 31.0[1]	818 31.6	787 32.5	762 30.5	753 29.4	3878 31.0
Urban	1685 69.0	1769 68.4	1638 67.6	1737 69.5	1810 70.6	8639 69.0
Total	2443 19.5[2]	2587 20.7	2425 19.4	2499 20.0	2563 20.5	12,517

[1]Row percent of column total
[2]Column percent of row total

The ten counties with the highest numbers of pedestrian-motor vehicle crashes for all five years are shown in Table 2 in descending order by crash frequency. The ten highest crash counties accounted for 55% of NC's reported pedestrian – motor-vehicle crashes. All of these counties are more than 50% urbanized, with most more than 80% urbanized, with the exceptions of Buncombe and Robeson. The average crash rate per 10,000 population for all of the ten counties was 3.6. Counties with considerably higher than average pedestrian crash rates based on population were, in descending order, Durham, Mecklenburg, New Hanover, Robeson, and Cumberland.

Table 2. Ten NC counties with Highest Numbers of Pedestrian crashes from 2003 to 2007

County	Number of Crashes	Percent of NC Total Crashes (12,517)	2007 County pop. estimate	Avg. yearly Crash rate / 10,000 pop.
Mecklenburg	1934	15.5	863,147	4.5
Wake	1276	10.2	832,590	3.1
Guilford	783	6.3	460,780	3.4
Cumberland	594	4.8	313,616	3.8
Durham	579	4.6	254,740	4.6
New Hanover	387	3.1	189,922	4.1
Forsyth	365	2.9	338,679	2.2
Buncombe	360	2.9	225,609	3.2
Gaston	344	2.8	200,972	3.4
Robeson	259	2.1	129,425	4.0
Total – 10 counties	6881	55.0	3,809,480	3.6

The ten cities with the highest numbers of pedestrian-motor vehicle crashes during these five years are shown in Table 3. These ten cities together accounted for about 43% of the state's 12,517 pedestrian crashes over the past five years. Among North Carolina cities, Charlotte accounts for 14.3% of statewide crashes over the past five years, followed by Raleigh (7.1%) and Durham (4.3%), which displaced Greensboro (now at 4.2%). The cities and counties with the highest numbers of pedestrian crashes are generally those with the largest populations although there is not an exact correlation as shown by the population-based crash rates in the right hand columns of Tables 2 and 3. Other factors affecting the rate of crashes per population include the extent of walking by residents and visitors, traffic volume, safety of roadways where pedestrians walk, and driver and pedestrian behaviors. Cities with universities and colleges and those with tourist destinations may have higher pedestrian activity. The crash rate based on population averages 4.7 per 10,000 people for these 10 cities, compared with 3.5 for all urban/municipal areas of the state.

Table 3. Ten NC cities with Highest Numbers of Pedestrian Crashes from 2003-2007

Municipality	Number of Crashes, all 5 years	Percent of NC Total	2007 Population	Avg. Yearly Crash Rate/10,000 pop.
Charlotte	1791	14.3	674,658	5.3
Raleigh	887	7.1	367,098	4.8
Durham	544	4.4	222,472	4.9
Greensboro	523	4.2	248,111	4.2
Fayetteville	413	3.3	181,453	4.6
Wilmington	284	2.3	100,746	5.6
Asheville	255	2.0	76,764	6.6
Winston-Salem	244	2.0	224,889	2.2
Gastonia	219	1.8	72,779	6.0
High Point	176	1.4	98,791	3.6
Total - 10 cities	5336	42.6	2,267,761	4.7

Some of the findings that follow are also undoubtedly related to exposure, or the number of pedestrians, as well as when, where, and which people are more likely to walk. Crash trends can change over time simply due to chance, due to exposure factors such as weather and trends in amount of walking and driving, and as a result of other factors including engineering, educational, and enforcement initiatives.

Pedestrian Characteristics

Pedestrian Age

It is difficult to draw firm conclusions about the year-to-year fluctuations in crash proportions by age across these five years (Table 4). (Note that the younger age categories span five years, while those beginning with age 30 span 10 years.) Crash involvement by age reflects both population and exposure or amount of walking among different age groups plus other risk factors. Older teens (16 to 20) and young adults (21 to 25) continue, however, to account for the greatest numbers and proportions of pedestrian crashes, probably reflecting greater pedestrian activity among these ages. Children ages 11 to 15 account for a larger share than younger age groups. Beginning with the 51 to 60 year group, the proportion of crash involvement begins to markedly decline with increasing age.

Table 4. Pedestrian age group for those involved in crashes

Pedestrian Age	YEAR					Total
	2003	2004	2005	2006	2007	
0 to 5	125 5.0 [1]	156 5.8	134 5.3	98 4.0	116 4.4	629 4.8
6 to 10	124 5.0	120 4.4	115 4.6	108 4.4	97 3.7	564 4.4
11 to 15	188 7.5	206 7.6	136 5.4	162 6.6	134 5.0	826 6.5
16 to 20	230 9.2	311 11.5	265 10.5	274 11.2	311 11.7	1391 10.9
21 to 25	277 11.1	298 11.0	278 11.1	279 11.4	278 10.5	1410 11.0
26 to 30	212 8.5	237 8.7	232 9.2	222 9.1	285 10.7	1188 9.3
31 to 40	423 17.0	465 17.1	433 17.2	370 15.1	392 14.8	2083 16.3
41 to 50	442 17.7	425 15.7	412 16.4	428 17.5	473 17.8	2180 17.0
51 to 60	242 9.7	248 9.1	296 11.8	284 11.6	295 11.1	1365 10.7
61 to 70	118 4.7	128 465.0	100 4.0	122 5.0	162 6.1	630 4.9
70+	133 5.3	137 5.0	130 5.2	122 5.0	137 5.2	659 5.1
Total	2491 19.4 [2]	2713 21.2	2512 19.6	2451 19.1	2656 20.7	12,823 [3]

[1] Row percent of column total

[2] Column percent of row total

[3] Total does not equal total pedestrians (13,071) due to unknown ages and missing data.

Pedestrian Gender

Males accounted for, on average, about 61% of the pedestrians reported involved in crashes over this five year period. Females were involved in nearly 39% of pedestrian crashes on average over this time period (Table 5). In the latest year, females were involved in a slightly higher frequency and percentage than is typical at 40%.

Table 5. Pedestrian gender for those involved in crashes

	YEAR					
Gender	**2003**	**2004**	**2005**	**2006**	**2007**	**Total**
Female	939 37.6 [1]	1028 38.1	993 39.5	918 37.7	1064 40.1	4942 38.6
Male	1558 62.4	1673 61.9	1523 60.5	1518 62.3	1591 59.9	7863 61.4
Total	2497 19.5 [2]	2701 21.1	2516 19.7	2436 19.0	2655 20.7	12805 [3]

[1] Row percent of column total [2] Column percent of row total [3] Total differs from total pedestrians involved (13,071) due to unknown values / missing data.

Pedestrian Race/Ethnicity

Pedestrian crashes in North Carolina are most likely to involve pedestrians reported to be of White racial background (approximately 51%; Table 6). However, 40% of persons are reported to be Black/African-American. Considering that African-Americans comprise about 22% of persons living in the State over this period (according to middle year, 2005 census data), Blacks are clearly over-represented in pedestrian crashes based on population. These proportions may, however, reflect greater amounts of walking by Blacks as well as other factors. Over this time period, those identified on crash report forms as Hispanic and persons of Asian descent have accounted for about 7% and around 1%, respectively, of pedestrians involved in crashes each year. Native Americans accounted for about 1.2% of the total, on average. Persons not identified in any of the other groups account for less than 1% of pedestrians involved in collisions.

Table 6. Pedestrian race/ethnicity for those involved in crashes

Ethnicity	YEAR					Total
	2003	2004	2005	2006	2007	
Asian	23 0.9 [1]	25 0.9	26 1.1	19 0.8	25 1.0	118 0.9
Black	982 40.1	1067 40.1	1005 40.6	945 39.3	1015 38.7	5014 39.8
Hispanic	172 7.0	184 6.9	185 7.5	136 5.7	183 7.0	860 6.8
Native American	27 1.1	25 0.9	28 1.1	32 1.3	36 1.4	148 1.2
Other	13 0.5	15 0.6	16 0.7	15 0.6	25 1.0	84 0.7
White	1231 50.3	1343 50.5	1216 49.1	1256 52.3	1342 51.1	6388 50.7
Total	2448 19.4 [2]	2659 21.1	2476 19.6	2403 19.1	2626 20.8	12,612 [3]

[1] Row percent of column total [2] Column percent of row total [3] Total differs from total pedestrians involved (13,071) due to missing data.

Pedestrian Injury Severity

Pedestrian crashes tend to be especially serious, with nearly 7% of struck pedestrians being killed, on average, compared less than 0.3% fatalities for all crash-involved people (mostly drivers and passengers) over the same time period. An additional 10% suffered serious (A-type) injuries over the five years (Table 7). NC's overall fatality rate for this 5-year time period averages 0.19 per 10,000 persons living in the State in 2007. Based on 2007 national data, North Carolina is ranked 12th highest of U.S. states for pedestrian fatalities (NHTSA Traffic Safety Facts 2007; available http://wwwnrd.nhtsa.dot.gov/Pubs/811002.PDF).

Table 7. Pedestrian injury severity for those involved in crashes

Injury	YEAR					Total
	2003	2004	2005	2006	2007	
K Killed	152 6.3 [1]	170 6.4	172 7.0	181 7.6	175 6.8	850 6.8
A Type Injury (disabling)	254 10.5	273 10.3	251 10.2	211 8.9	223 8.7	1212 9.7
B Type Injury (evident)	897 37	1018 38.4	908 37.0	875 36.8	992 38.6	4690 37.6
C Type Injury (possible)	960 39.6	1004 37.9	977 39.8	939 39.5	1041 40.5	4921 39.4
O No Injury	161 6.6	185 7.0	149 6.1	174 7.3	140 5.5	809 6.5
Total	2424 19.4 [2]	2650 21.2	2457 19.7	2380 19.1	2571 20.6	12,482 [3]

[1] Row percent of column total [2] Column percent of row total [3] Total differs from total pedestrians involved (13,071) due to missing data or unknown values.

Pedestrian Alcohol Use

The investigating officer indicated alcohol use by an average of about 12% of the pedestrians struck by motor vehicles over this five year period (Table 8). Suspected use does not necessarily imply that the pedestrian was impaired at the time of the crash, but that evidence of alcohol use was detected.

Table 8. Pedestrian use of alcohol

Alcohol Detected/Suspected	YEAR					Total
	2003	2004	2005	2006	2007	
No	2306 89.5[1]	2413 87.7	2258 88.2	2204 88.7	2362 87.8	11,543 88.3
Yes	271 10.5	339 12.3	303 11.8	282 11.3	329 12.2	1524 11.7
Total	2577 19.7 [2]	2752 21.1	2561 19.6	2486 19.0	2691 20.6	13,067[3]

[1] Row percent of column total [2] Column percent of row total [3] Total differs from total pedestrians involved (13.071) due to missing data.

Driver and Vehicle Characteristics

Driver Age

There are slight year-to-year fluctuations in the distributions of driver age group involved in pedestrian crashes across the five years of data, but generally similar levels (Table 9). Younger drivers tend to be most involved in crashes with pedestrians as with crashes in general, with the 20 to 24 year age group having highest involvement; this 5year age group accounted for about 14% of collisions with pedestrians. Older drivers ages 60-69 and 70+ account for the smallest proportions of collisions with pedestrians, although 2007 saw higher numbers and percentages for both of those age groups.

Table 9. Age of drivers involved in crashes with pedestrians

Driver Age	Year					Total
	2003	2004	2005	2006	2007	
< 20 years	239 11.0 [1]	258 11.3	229 10.9	278 12.2	218 9.9	1222 11.1
20 - 24	318 14.7	329 14.5	290 13.8	324 14.2	305 13.9	1566 14.2
25 - 29	253 11.7	256 11.3	252 12.0	248 10.9	229 10.4	1238 11.2
30 - 39	441 20.3	430 18.9	378 18.0	417 18.3	428 19.5	2094 19.0
40 - 49	325 15.0	406 17.8	378 18.0	386 16.9	357 16.2	1852 16.8
50 - 59	269 12.4	271 11.9	275 13.1	305 13.4	287 13.1	1407 12.8
60 - 69	150 6.9	170 7.5	163 7.7	170 7.4	207 9.4	860 7.8
70+	174 8.0	156 6.9	141 6.7	157 6.9	168 7.6	796 7.2
Total	2169 19.7 [2]	2276 20.6	2106 19.1	2285 20.7	2199 19.9	11,035 [3]

[1] Row percent of column total [2] Column percent of row total [3]Total differs from total drivers involved (14,267) due to missing data, including for unidentified hit and run drivers.

Driver Gender

Male drivers account for 58% of the pedestrian-motor vehicle crashes over the five years, and female drivers, about 42% (Table 10). There is little year to year variability in these percentages, although female drivers showed a higher rate of involvement in 2007 at about 45%.

Table 10. Gender of drivers involved in crashes with pedestrians

Driver Gender	YEAR					Total
	2003	2004	2005	2006	2007	
Female	924 42.6 [1]	965 42.4	867 41.0	937 41.0	989 44.9	4682 42.4
Male	1247 57.4	1309 57.6	1250 59.1	1347 59.0	1214 55.1	6367 57.6
Total	2171 19.7 [2]	2274 20.6	2117 19.2	2284 20.7	2203 20.0	11,049 [3]

[1] Row percent of column total [2] Column percent of row total [3] Total differs from total drivers involved (14,267) due to missing data, including for unidentified hit and run drivers.

Driver Race/Ethnicity

White drivers are involved in about 60% and Black drivers 32% of the crashes with pedestrians (Table 11). Blacks have greater representation as drivers involved in collisions with pedestrians than their overall representation in all traffic crashes (24.5%). Hispanic drivers account for about 5% of collisions with pedestrians, and Asians and Native Americans about 1% each according to information from police crash-reports.

Table 11. Ethnicity of drivers involved in pedestrian crashes

Ethnicity	YEAR					Total
	2003	2004	2005	2006	2007	
Asian	20 0.9 [1]	30 1.3	21 1.0	21 0.9	21 1.0	113 1.0
Black	692 32.0	710 31.4	638 30.3	731 32.3	687 31.4	3458 31.5
Hispanic	112 5.2	107 4.7	132 6.3	119 5.3	121 5.5	591 5.4
Native American	25 1.2	16 0.7	27 1.3	30 1.3	27 1.2	125 1.1
Other	21 1.0	12 0.5	19 0.9	23 1.0	22 1.0	97 0.9
White	1290 59.7	1389 61.4	1267 60.2	1337 59.1	1312 59.9	6595 60.1
Total	2160 19.7 [2]	2264 20.6	2104 19.2	2261 20.6	2190 20.0	10,979 [3]

[1] Row percent of column total [2] Column percent of row total [3] Total differs from total drivers involved (14,267) due to missing data including for unidentified hit and run drivers.

Driver Injury Severity

Less than 8% of drivers involved in collisions with pedestrians were reported to be injured over this time period on average (killed, A, B, or C in the table below). Those injuries that do occur are rarely serious (Table 12). About four-tenths of 1% suffered serious (A-type) or fatal injuries in crashes with pedestrians. The proportion of drivers injured is fairly consistent from year to year.

Table 12. Injury severity for drivers involved in crashes with pedestrians

Driver Injury	YEAR					Total
	2003	2004	2005	2006	2007	
K Killed	1 0.1 [1]	1 0.0	3 0.1	4 0.2	3 0.1	12 0.1
A Type (disabling)	7 0.3	5 0.2	7 0.3	15 0.7	1 0.0	35 0.3
B Type (evident)	38 1.8	40 1.8	56 2.7	92 4.1	32 1.5	258 2.4
C Type (possible)	109 5.2	108 4.8	103 5.0	137 6.1	78 3.6	535 5.0
O No Injury	1963 92.7	2081 93.1	1901 91.8	1987 88.9	2032 94.7	9964 92.2
Total	2118 19.6 [2]	2235 20.7	2070 19.2	2235 20.7	2146 19.9	10,804 [3]

[1] Row percent of column total [2] Column percent of row total [3] Total differs from total drivers involved (14,267) due to missing data including for unidentified hit and run drivers.

Driver Alcohol Use

The investigating officer detected or suspected alcohol use by the drivers involved in pedestrian crashes in an average of about 4% of the crashes for all five years (Table 13). This means that the investigating police officer reported detecting alcohol; it does not necessarily imply intoxication.

Table 13. Use of alcohol by drivers involved in crashes with pedestrians

Alcohol Detected/Suspected	YEAR					Total
	2003	2004	2005	2006	2007	
No	2114 96.2 [1]	2226 96.4	2078 96.0	2258 95.5	2168 95.7	10,844 95.9
Yes	84 3.8	84 3.6	87 4.0	106 4.5	98 4.3	459 4.1
Total	2198 19.5 [2]	2310 20.4	2165 19.2	2364 20.9	2266 20.1	11,303 [3]

[1] Row percent of column total [2] Column percent of row total [3] Total differs from total drivers involved (14,267) due to missing data, including for unidentified hit and run drivers.

Vehicle Type

Most vehicles involved in crashes with pedestrians are passenger vehicles, including cars, pickups, light truck/mini vans, sport utility vehicles (SUVs), and vans, which together account for about 94% of collisions with pedestrians (Table 14). While passenger cars account for the majority (57%), pickups account for nearly 15%, and SUVs have accounted for a steadily increasing share over the past five years, accounting for nearly 17% of collisions with pedestrians in 2007 (average of 14%). Vans and light trucks/mini-vans account for 8.7% of collisions. Heavier vehicles tend to result in more severe injuries to pedestrians. Pedestrians struck by SUVs and light trucks/mini vans were more likely to be killed (9.1% - 9.2%, respectively), than those struck by passenger cars (5.7%).

School buses have been involved in an average of a little more than 10 crashes with pedestrians per year over the past five years; three of the 52 collisions resulted in fatalities. Commercial buses were involved in about 7 pedestrian collisions per year across the state; 3 of the 37 total involved fatalities. Commercial types of vehicles including vans, single unit trucks, taxicabs, heavy trucks, and emergency and other types of vehicles account for the remaining crashes with pedestrians. Three-axle and larger trucks and tractors accounted for 1.8% of these collisions and also tend to result in a high proportion of fatal and serious injuries with about 30% of those being struck by these vehicle types being killed.

Table 14. Vehicle types involved in crashes with pedestrians

Vehicle Type	YEAR					Total
	2003	2004	2005	2006	2007	
Activity Bus	1 0.0 [1]	1 0.00	2 0.1	0 0	1 0.0	5 0.0
All Terrain Vehicle (Atv)	1 0.0	0 0	0 0	0 0	2 0.1	3 0.0
Commercial Bus	5 0.2	6 0.2	8 0.3	11 0.5	7 0.3	37 0.3
Ems Vehicle - Ambulance - Rescue Squad	2 0.1	4 0.2	2 0.1	0 0	6 0.2	14 0.1
Farm Tractor	0 0	0 0	0 0	0 0	0 0	0 0
Fire Truck	1 0.0	0 0	1 0.0	2 0.1	0 0	4 0.0
Light Truck (Mini-Van - Panel)	63 2.6	58 2.2	57 2.3	55 2.3	55 2.2	288 2.3
Moped	0 0	1 0.0	0 0	1 0.0	0 0	2 0.0
Motor Home/Recreational Vehicle	2 0.1	1 0.0	3 0.1	1 0.0	2 0.1	9 0.1
Motorcycle	12 0.5	9 0.3	24 1.0	14 0.6	15 0.6	74 0.6
Other	2 0.1	3 0.1	2 0.1	5 0.2	3 0.1	15 0.1
Other Bus	6 0.2	0 0	2 0.1	3 0.1	4 0.2	15 0.1
Passenger Car	1394 56.7	1548 59.3	1398 57.1	1366 56.4	1345 53.5	7051 56.6
Pedalcycle	2 0.1	2 0.1	1 0.0	1 0.0	0 0	6 0.1
Pickup	369 15	371 14.2	352 14.4	366 15.1	363 14.4	1821 14.6
Police	21 0.9	19 0.7	11 0.5	22 0.9	18 0.7	91 0.7
School Bus	11 0.5	12 0.5	12 0.5	10 0.4	7 0.3	52 0.4
Single Unit Truck (2-axle - 6-tire)	39 1.6	43 1.7	38 1.6	36 1.5	27 1.1	183 1.5
Single Unit Truck (3 Or More Axles)	4 0.2	16 0.6	5 0.2	13 0.5	6 0.2	44 0.4
Sport Utility	316 12.9	324 12.4	341 13.9	339 14.0	419 16.7	1739 14.0
Taxicab	6 0.2	4 0.2	5 0.2	8 0.3	6 0.2	29 0.2
Tractor/Tractor & Semi-Trailer	26 1.1	20 0.8	38 1.6	16 0.7	20 0.8	120 1.0

Vehicle Type	YEAR					Total
	2003	2004	2005	2006	2007	
Truck	11 0.5	11 0.4	6 0.2	8 0.3	13 0.5	49 0.4
Unknown Heavy Truck	4 0.2	1 0.0	3 0.1	2 0.1	5 0.2	15 0.1
Van	162 6.6	158 6.1	138 5.6	145 6.0	189 7.5	792 6.4
Total	2460 19.8[2]	2612 21.0	2449 19.7	2424 19.5	2513 20.2	12,458[3]

[1] Row percent of column total [2] Column percent of row total [3] Total differs from total drivers involved (14,267) due to missing data including for unidentified hit and run drivers.

Temporal and Environmental Factors

Month of Year

Pedestrian crashes in North Carolina are fairly evenly distributed throughout the year, with lower numbers occurring during the late winter months of February (a short month) and March, and the warmer months of May, June and July (Table 15). Monthly peaks vary from year to year, but for the five years of data, the highest average numbers of crashes have occurred in the fall months of November, followed by October and December.

Table 15. Pedestrian crashes by month of the year

	YEAR					
Month	**2003**	**2004**	**2005**	**2006**	**2007**	**Total**
January	202 8.27 [1]	194 7.5	189 7.79	210 8.4	163 6.36	958 7.65
February	163 6.67	160 6.18	164 6.76	190 7.6	171 6.67	848 6.77
March	197 8.06	211 8.16	198 8.16	188 7.52	186 7.26	980 7.83
April	207 8.47	214 8.27	190 7.84	228 9.12	188 7.34	1027 8.2
May	182 7.45	203 7.85	213 8.78	205 8.2	194 7.57	997 7.97
June	199 8.15	200 7.73	175 7.22	192 7.68	196 7.65	962 7.69
July	218 8.92	223 8.62	160 6.6	172 6.88	219 8.54	992 7.93
August	205 8.39	211 8.16	198 8.16	208 8.32	235 9.17	1057 8.44
September	214 8.76	245 9.47	240 9.9	226 9.04	219 8.54	1144 9.14
October	236 9.66	230 8.89	220 9.07	240 9.6	279 10.89	1205 9.63
November	211 8.64	258 9.97	225 9.28	242 9.68	262 10.22	1198 9.57
December	209 8.56	238 9.2	253 10.43	198 7.92	251 9.79	1149 9.18
Total	2443 19.52 [2]	2587 20.67	2425 19.37	2499 19.96	2563 20.48	12,517

[1] Row percent of column total [2] Column percent of row total

Day of the Week

Pedestrian crashes in NC are most likely to occur on a Friday with the second highest number occurring on Saturdays. Pedestrian crashes are least likely to occur on a Sunday (Table 16). These results are typically consistent from year to year, but in 2003 there was a spike in Wednesday crashes and a lower number and proportion of crashes occurred on Saturdays.

Table 16. Pedestrian crashes by day of the week

Day of Week	YEAR					Total
	2003	2004	2005	2006	2007	
Monday	349 14.29 [1]	354 13.68	336 13.86	307 12.28	378 14.75	1724 13.77
Tuesday	317 12.98	342 13.22	333 13.73	367 14.69	353 13.77	1712 13.68
Wednesday	394 16.13	381 14.73	364 15.01	332 13.29	384 14.98	1855 14.82
Thursday	374 15.31	363 14.03	334 13.77	362 14.49	370 14.44	1803 14.40
Friday	402 16.46	456 17.63	420 17.32	446 17.85	443 17.28	2167 17.31
Saturday	315 12.89	392 15.15	378 15.59	382 15.29	389 15.18	1856 14.83
Sunday	292 11.95	299 11.56	260 10.72	303 12.12	246 9.6	1400 11.18
Total	2443 19.52 [2]	2587 20.67	2425 19.37	2499 19.96	2563 20.48	12,517

[1] Row percent of column total [2] Column percent of row total

Time of Day

Pedestrian crashes were most likely to occur in the afternoon and early evening between the hours of 3 to 6 p.m. and 6 to 9 p.m., followed by mid-day from noon to 3 pm (Table 17). Above 41% of pedestrian collisions occurred during these six hours. There are also more pedestrian crashes between 9 p.m. and midnight than between 9 a.m. to noon, suggesting over-involvement of pedestrians in crashes at night; exposure data to test this hypothesis are, however, lacking. Fewer crashes occur during late night and early morning hours; however, night-time collisions are, however associated with greater injury severity, and more often involve alcohol use. For example, over this period approximately 10% of pedestrians struck during 9 pm to midnight, 14% of those struck midnight to 3 am, and nearly 22% of those struck from 3 to 6 am were killed compared to 6.8% of those struck over all hours. There is little notable year to year variability in these trends.

Table 17. Pedestrian crashes by time of day

Time of Day	YEAR					Total
	2003	2004	2005	2006	2007	
midnight to 3 am	157 6.43 [1]	168 6.49	154 6.35	187 7.48	163 6.36	829 6.62
3 am to 6 am	71 2.91	86 3.32	70 2.89	87 3.48	103 4.02	417 3.33
6 am to 9 am	203 8.31	235 9.08	229 9.44	198 7.92	237 9.25	1102 8.8
9 am to noon	266 10.89	266 10.28	279 11.51	268 10.72	299 11.67	1378 11.01
noon to 3 pm	390 15.96	396 15.31	357 14.72	379 15.17	364 14.20	1886 15.07
3 pm to 6 pm	524 21.45	551 21.3	514 21.2	538 21.53	511 19.94	2638 21.08
6 pm to 9 pm	512 20.96	517 19.98	497 20.49	534 21.37	543 21.19	2603 20.8
9 pm to midnight	320 13.1	368 14.22	325 13.4	308 12.32	343 13.38	1664 13.29
Total	2443 19.52 [2]	2587 20.67	2425 19.37	2499 19.96	2563 20.48	12,517

[1] Row percent of column total [2] Column percent of row total

Light Condition

While 57% of collisions occurred during daylight hours, over 42% of pedestrian crashes over the past five years have occurred during non-daylight conditions, including dawn and dusk. Most of these crashes occur under conditions of darkness (Table 18). A majority of night-time crashes occur on lighted roadway segments (typically urban areas), although almost as many occur in unlighted areas. Those struck at night on unlighted roadways are more like to be killed (nearly 18%) compared with those struck at night on lighted roadways (7%; data not shown). This likely reflects a number of factors including higher speeds associated with rural (unlighted) roads, and perhaps a decreased tendency for drivers to detect and slow before striking pedestrians on unlighted roadways. Trends are fairly consistent across the five years of data, but there are slight year-to-year fluctuations. As with late night times-of-day, night-time collisions are probably over-represented based on the amount of walking and driving that occurs during hours of darkness, but data are lacking to support this conjecture.

Table 18. Pedestrian crashes by light condition

Light Condition	YEAR					Total
	2003	2004	2005	2006	2007	
Dark - Lighted Roadway	469 19.24 [1]	531 20.55	466 19.26	528 21.15	501 19.57	2495 19.96
Dark - Roadway Not Lighted	416 17.06	466 18.03	445 18.39	455 18.23	481 18.79	2263 18.11
Dark - Unknown Lighting	17 0.7	15 0.58	13 0.54	13 0.52	18 0.7	76 0.61
Dawn	22 0.9	26 1.01	28 1.16	29 1.16	33 1.29	138 1.1
Daylight	1441 59.11	1469 56.85	1396 57.69	1389 55.65	1450 56.64	7145 57.17
Dusk	67 2.75	71 2.75	67 2.77	74 2.96	76 2.97	355 2.84
Other	6 0.25	6 0.23	5 0.21	8 0.32	1 0.04	26 0.21
Total	2438 19.51[2]	2584 20.68	2420 19.36	2496 19.97	2560 20.48	12,498 [3]

[1] Row percent of column total [2] Column percent of row total [3] Total does not equal total number of collisions (12,517) due to missing data and unknown cases.

Weather

The vast majority (93%) of pedestrian crashes occur under clear or cloudy (not raining) weather conditions on average (Table 19), no doubt reflecting exposure. Year to year variation in the number of crashes occurring under rainy, snowy/icy, or foggy/smoky conditions is also likely a reflection of exposure to these conditions (e.g., more pedestrian crashes under rainy or snowy conditions in years when the state received more snowfall).

Table 19. Pedestrian crashes by weather conditions

	YEAR					
Weather	**2003**	**2004**	**2005**	**2006**	**2007**	**Total**
Clear	1735 71.02 [1]	1888 72.98	1841 75.92	1961 78.47	2095 81.74	9520 76.06
Cloudy	491 20.1	507 19.6	407 16.78	381 15.25	317 12.37	2103 16.8
Fog / Smog /Smoke	13 0.53	9 0.35	17 0.7	8 0.32	11 0.43	58 0.46
Other	6 0.25	5 0.19	6 0.25	0 0	6 0.23	23 0.18
Rain	181 7.41	154 5.95	142 5.86	146 5.84	128 4.99	751 6.0
Severe Crosswinds	0 0	0 0	0 0	1 0.04	0 0	1 0.01
Snow - Sleet - H	17 0.7	24 0.93	12 0.49	2 0.08	6 0.23	61 0.49
Total	2443 19.52 [2]	2587 20.67	2425 19.37	2499 19.96	2563 20.48	12,517

[1] Row percent of column total [2] Column percent of row total

Roadway Characteristics

Roadway Classification

Nearly half (46%) of all pedestrian-motor vehicle crashes occurred on local (mostly city) streets reflecting higher levels of walking/numbers of pedestrians in cities and neighborhoods (Table 20). Around 25% of reported pedestrian crashes in this five year period occurred in parking lots, public driveways, or other public vehicular areas. About 12% occurred along State Secondary routes. All other roadway classifications accounted for about 14% of the total, including around 5% on NC Routes and 7% on US Routes, with approximately 2% on Interstate Routes. Collisions on interstates often involve pedestrians that were involved in a prior vehicle-to-vehicle collision and were struck attempting to cross the expressway, or standing near or walking to or from a disabled vehicle. Collisions that occurred on private property were reported frequently enough to comprise about 3% of the reported crashes.

Table 20. Pedestrian crashes by roadway classification

	YEAR					
Road Class	**2003**	**2004**	**2005**	**2006**	**2007**	**Total**
Interstate Route	54 2.21[1]	56 2.16	50 2.06	44 1.76	40 1.56	244 1.95
Local Street	1179 48.26	1164 44.99	1096 45.2	1141 45.66	1194 46.59	5774 46.13
North Carolina Route	131 5.36	139 5.37	129 5.32	143 5.72	127 4.96	669 5.34
Private Property	64 2.62	66 2.55	68 2.8	70 2.8	90 3.51	358 2.86
Public Vehicular Area (ex. Parking lot)	559 22.88	646 24.97	605 24.95	649 25.97	652 25.44	3111 24.85
State Secondary Route	288 11.79	351 13.57	308 12.7	301 12.04	300 11.71	1548 12.37
United States Route	168 6.88	165 6.38	169 6.97	151 6.04	160 6.24	813 6.5
Total	2443 19.52[2]	2587 20.67	2425 19.37	2499 19.96	2563 20.48	12,517

[1] Row percent of column total [2] Column percent of row total

Number of Through Lanes

Number of lanes indicated should reflect number of *through* lanes, excluding limited turn lanes and other non-continuing lanes. The table below excludes pedestrian crashes that occurred on public vehicular areas and other non-roadway locations (Table 21). The majority of reported on-roadway pedestrian crashes occurred on two-lane roads (a fairly consistent 59 - 60% year-to-year), while approximately 30% occurred on roadways with four or more travel lanes. There are year-to-year fluctuations in most categories. The numbers of crashes reflect amounts of walking and driving on roadways with different numbers of lanes as well as other possible differences in risk exposure to crashes. There are also likely to be some inaccuracies in these data, with officers interpreting numbers of lanes differently based on divided/undivided and other roadway characteristics.

Table 21. Pedestrian crashes by number of through traffic lanes

Number of Thru Lanes	YEAR					Total
	2003	2004	2005	2006	2007	
1	83 4.45[1]	96 4.73	84 4.5	81 4.17	91 4.51	435 4.47
2	1103 59.17	1205 59.39	1119 59.94	1137 58.52	1207 59.78	5771 59.36
3	124 6.65	137 6.75	102 5.46	112 5.76	120 5.94	595 6.12
4	282 15.13	319 15.72	288 15.43	343 17.65	321 15.9	1553 15.97
5	146 7.83	160 7.89	159 8.52	152 7.82	150 7.43	767 7.89
6 or 7	101 5.42	88 4.34	90 4.82	80 4.12	106 5.25	465 4.78
8+	25 1.34	24 1.18	25 1.34	38 1.96	24 1.19	136 1.4
Total	1864 19.17[2]	2029 20.87	1867 19.2	1943 19.99	2019 20.77	9722[3]

[1] Row percent of column total [2] Column percent of row total [3] Total reflects only on-roadway crashes for which number of lanes is not missing.

Speed Limit

Two-thirds (66%) of pedestrian crashes on public roadways took place on roads with speed limits of 35 mph or less reflecting speeds on urban streets where more walking takes place (Table 22). The 36 - 45 mph roadways account for about 18% of crashes, and above 45 mph roadways another 17% of crashes. There seems to be a slight increasing trend in crashes on the lowest speed category (15 mph and lower) of roads, perhaps reflecting an increasing use of very low speed limits on some roads.

Table 22. Pedestrian crashes by speed limit of roads

Speed Limit	YEAR					Total
	2003	2004	2005	2006	2007	
0-15 MPH	242 11.93[1]	286 12.95	299 14.81	331 15.5	374 16.59	1532 14.39
16-25 MPH	272 13.41	296 13.41	274 13.57	284 13.3	303 13.44	1429 13.42
26-35 MPH	803 39.58	825 37.36	765 37.89	807 37.78	829 36.78	4029 37.85
36-45 MPH	340 16.76	425 19.25	354 17.53	393 18.4	417 18.5	1929 18.12
46-55 MPH	324 15.97	326 14.76	273 13.52	279 13.06	284 12.6	1486 13.96
56+ MPH	48 2.37	50 2.26	54 2.67	42 1.97	47 2.09	241 2.26
Total	2029 19.06[2]	2208 20.74	2019 18.96	2136 20.06	2254 21.17	10,646[3]

[1] Row percent of column total [2] Column percent of row total [3] Total reflects only on-roadway crashes for which the speed limit was reported.

Roadway Feature

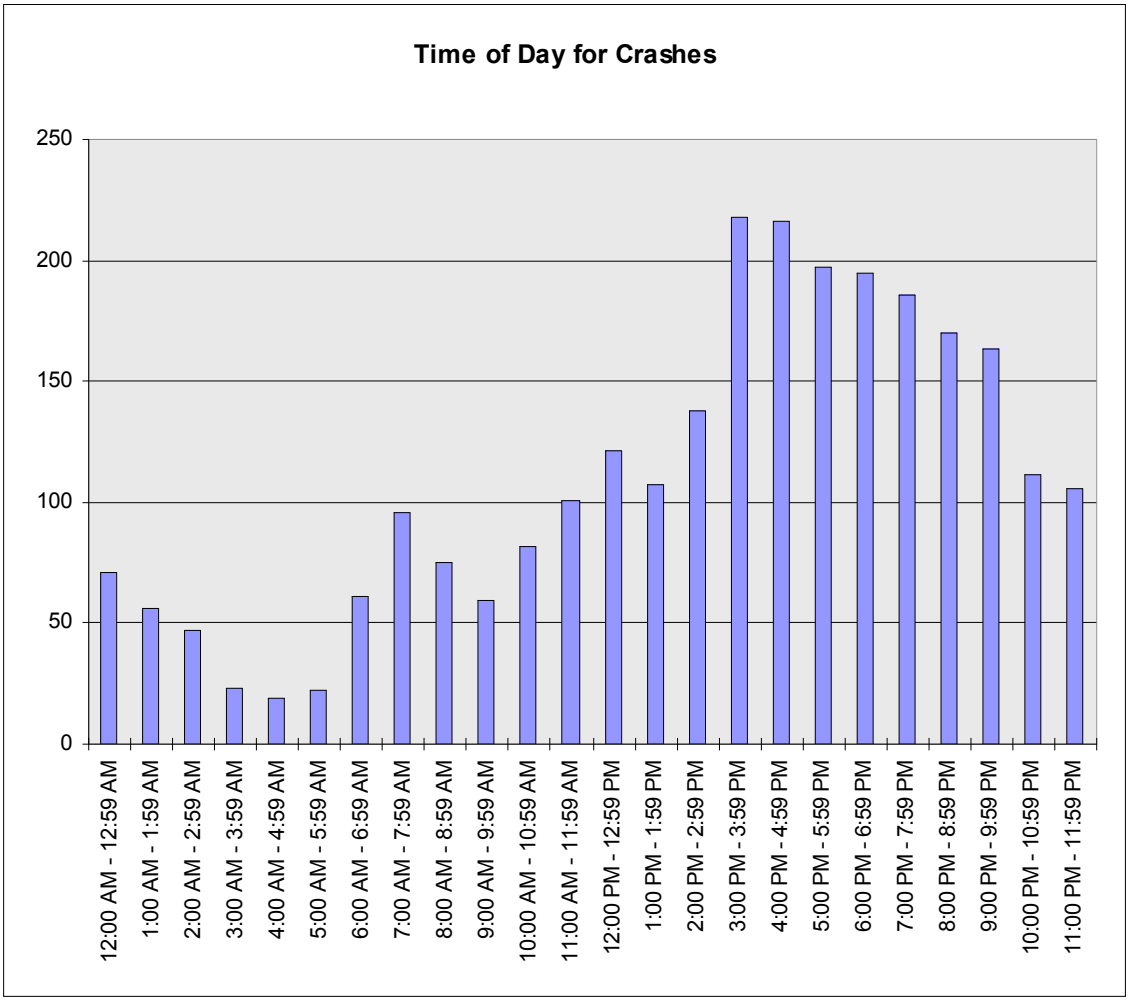
On average, over this time period, approximately 62% of crashes occurred on roadway locations with no special features (i.e., in between intersections, bridges, underpasses, etc.) (Table 23). For this table, detailed features that have few reported crashes have been combined. According to state crash data, intersection locations accounted for about 14% of pedestrian crashes, with the majority occurring at four-way intersections. (Note that during the crash typing process, analysts coded general crash location [intersection/non-intersection] from analysis of crash diagrams, narratives, and other information contained on hard copies of the police crash report. The percent of intersection or intersection-related collisions coded in this way accounted for a somewhat higher percentage of pedestrian-related collisions, about 23% combined. These data are summarized in the Crash Types Summary Report). Crashes at public and private driveways account for 13% and 7%, respectively. No other road feature category exceeds 1% of the total, except for the "Other" category which includes any other features not specifically identified.

Table 23. Pedestrian crashes by roadway feature

Road Feature	YEAR					Total
	2003	2004	2005	2006	2007	
No Special Feature	1534 62.79[1]	1604 62	1479 60.99	1599 63.99	1652 64.46	7868 62.86
Bridge or Bridge Approach	23 0.94	22 0.85	23 0.95	23 0.92	17 0.66	108 0.86
Underpass	1 0.04	5 0.19	7 0.29	6 0.24	5 0.2	24 0.19
Driveway - Public	322 13.18	344 13.3	342 14.1	313 12.53	322 12.56	1643 13.13
Driveway - Private	154 6.3	179 6.92	157 6.47	139 5.56	163 6.36	792 6.33
Intersection	355 14.53	390 15.08	356 14.68	351 14.05	354 13.81	1806 14.43
Non intersection Median Crossing	2 0.08	3 0.12	0 0	2 0.08	1 0.04	8 0.06
Begin./End Divided Highway	3 0.12	1 0.04	1 0.04	1 0.04	0 0	6 0.05
On - Off Ramp	16 0.65	11 0.43	20 0.82	24 0.96	15 0.59	86 0.69
Railroad Crossing	3 0.12	1 0.04	1 0.04	1 0.04	2 0.08	8 0.06
Other	30 1.23	27 1.04	39 1.61	40 1.6	32 1.25	168 1.34
Total	2443 19.52[2]	2587 20.67	2425 19.37	2499 19.96	2563 20.48	12,517

[1] Row percent of column total [2] Column percent of row total

For more information about pedestrian crashes in North Carolina and events leading up to the crashes, see the **Pedestrian Crash Types Summary, 2003 – 2007,** available at http://www.pedbikeinfo.org/pbcat/pdf/summary_ped_types5yrs.pdf .


Time of Day for Crashes
250
200
150
100
50
0
12:00 AM - 12:59 AM
1:00 AM - 1:59 AM
2:00 AM - 2:59 AM
3:00 AM - 3:59 AM
4:00 AM - 4:59 AM
5:00 AM - 5:59 AM
6:00 AM - 6:59 AM
7:00 AM - 7:59 AM
8:00 AM - 8:59 AM
9:00 AM - 9:59 AM
10:00 AM - 10:59 AM
11:00 AM - 11:59 AM
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7:00 PM - 7:59 PM
8:00 PM - 8:59 PM
9:00 PM - 9:59 PM
10:00 PM - 10:59 PM
11:00 PM - 11:59 PM

Day of the Week for Crashes